Farm Chemicals

Highlights of MWSIC 42

"Dress Up" Your Drums 45

The Future of Weed Control . . . 46

Ag Policy Rumblings 49

Men, Money and Credit 51

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When your formulations call for iron additives, insist upon SEQUESTRENE Iron Chelates produced by Geigy Agricultural Chemicals, pioneers in the field of metal chelates for agriculture. SEQUESTRENE Iron Chelates, in combination with fertilizer ingredients, provide a source of available iron necessary for normal plant growth. SEQUESTRENE chelates are completely water soluble.

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- *SEQUESTRENE NaFe Iron Chelate. For use on acid soils. 12% iron as metallic.*
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SEQUESTRENE Iron Chelates are available in 50-lb. drums, and 5-lb. bags.

In addition to fertilizer-chelate combination, SEQUESTRENE Iron Chelates may be applied alone as foliage sprays or soil treatments. For resale to the home garden trade SEQUESTRENE Iron Chelates are available in 1-lb. canisters and 4-oz. polyethylene bags.

3 more of the Geigy "Big 4"

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Safe, effective miticide for control of various species of mites on apples, pears, azaleas, holly, spruce, and other ornamental and agricultural crops. Long residual action. Relatively non-toxic to bees.

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"General purpose" insecticide. For control of insect pests of livestock, crops, and stored grain. Safe to use. Long residual action. Ideal for aerosol and spray formulations.

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The most effective and economical residual fly control available. Only two or three residual sprayings are required to control flies in dairy barns for an entire season.

*"SEQUESTRENE" is the brand name for metal chelates sold by Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation

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Farm Chemicals

PIONEER JOURNAL OF THE INDUSTRY, EST. 1894

FEATURES

Highlights of the MWSIC Meeting 42
"Dress up" Your Drums 45
The Future of Weed Control 46
W. R. Furtick
Ag Policy Rumblings in Washington 49
John Harms
Men, Money and Credit—NAC Spring Meeting 51

INDUSTRY NEWS

Business & Management ... 4
Calendar 14
People 16
Associations & Meetings ... 24
Government 28

DEPARTMENTS

Viewing Washington
On Agriculture 31
On Business 32
Reader Service 37
Equipment & Supplies 57
Suppliers' Briefs 59
Patent Reviews 60
Dr. Melvin Nord
Chemicals 62
Pest Reports 63
Statistics 65
Fertilizer Materials Markets 66
Buyers' Guide 71

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IN THIS ISSUE

Men, Money and Credit provided an inspiring theme for the spring meeting of the National Agricultural Chemicals Association held in San Francisco last month. Highlights of the meeting began on page 51.

The Crag Chemicals people found that they are not only winning prizes but gaining improved product recognition after "dressing up their drums." For this story see page 45.

Herbicides were near the bottom of the list in pesticide sales last year. On page 46 you will find an analysis of the situation and what some of the prospects are for the future in weed control.

Far-reaching changes in agricultural policies and programs now in the works are likely to have as much impact, if not more, on the fertilizer and pesticide industry as the Soil Bank. For this story see page 49.

COVER STORY

One view of the new $14 million fertilizer materials plant of the Southern Nitrogen Company, Inc., which in February started production of ammonia and in March started making nitrogen solutions. This month production will start on solid ammonium nitrate. The plant is located in Savannah, Georgia and is the only nitrogen manufacturer in the heart of the Southeast.

COPPER—the IDEAL FUNGICIDE

We are miners of Copper bearing ores, from which is produced in our integrated plants a wide variety of Copper Chemicals. Our technical know-how and basic position in Copper, along with our years of experience in agricultural fungicides, is your assurance of exacting quality control, strict uniform consistency, a plentiful supply and outstanding performance in the field.

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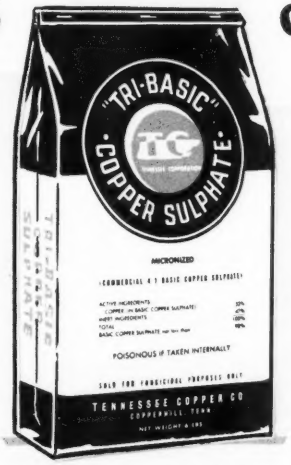

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Time Tested and Commercially Proven the Superior Fungicide

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LION MOVES PRODUCTION SUPERVISORS TO HOUSTON

Lion Oil Co., div. of Monsanto Chemical Co., plans to move the offices of personnel supervising its production and exploration operations from El Dorado to Houston, Tex.

In announcing the move, T. M. Martin, Lion president, pointed out that the firm has joined with several other companies in oil and gas ventures in Venezuela and is participating in other foreign exploration in Central and South America. Houston is a more convenient base for such foreign activity and also presents greater opportunity for entering into offshore drilling in the Gulf of Mexico. General offices and headquarters for refining, marketing, and other activities will remain in El Dorado.

Martin also reported that responsibility for operation of the El Dorado chemical plant and the Barton plant were to be transferred to Monsanto's Inorganic Chemicals Div. about April 1. He pointed out that the transfer does not indicate any change in manufacturing operations.

DAVISON INTRODUCES TWO GARDEN FERTILIZERS

Davison Chemical Co., Div. of W. R. Grace & Co., this year will introduce two products in the rapidly expanding market for garden and lawn fertilizers, initially on a limited area basis.

Nurish, a water-soluble plant food for lawns, flowers, vegetables, ornamentals and greenhouses, will be offered in middle western cities this spring. Wonder-Gro, a granulated fertilizer especially formulated for lawns and ornamentals, will also be promoted for the home fertilizer market.

Nurish is being produced in new facilities installed at Davison's Alliance, O., plant. They are air-conditioned to maintain low humidity, under which the product is packed in 1 and 3 pound polyethylene bags, to keep the material moisture-free. A 50-pound polyethylene-lined paper bag also is produced, primarily for landscapers and nurseries. Nurish has a 20-20-20 formula plus trace elements.

Wonder-Gro, a 12-6-6 fertilizer, made at Davison's plants in Columbus, O., and Lansing, Mich. is being marketed in 25 and 50 pound bags. It also carries the company's trade-marked 5 Star minor element mix.

A special Products Dept. has been organized to handle the home consumer items under B. C. Manker, Davison manager at Lansing.

After this year, expansion into other markets is planned, extensively penetrating the areas in which Davison products for farm use are sold, and eventually reaching nation-wide extent.

CORONET WINS DOUGLASS TROPHY

Their outstanding safety record in 1956 has won for employees of Coronet Phosphate Co., a Smith-Douglass Co. division, the Ralph B. Douglass trophy. The big bronze trophy was presented yesterday by Vernon S. Gornto, safety director of Smith-Douglass, during a monthly meeting of the safety committee. R. M. Wilbur, manager of the Coronet division, accepted the award on behalf of the employees.

The 12 plants of Smith-Douglass compete for the award. Gaither Newnam, safety director of Coronet, said he was proud of the record set and especially of the employees of the Tenoroc mine near Lakeland who have worked 1,200,000 man hours without a lost-time accident.

He attributed much of their success to an enthusiasm and desire to carry out a good safety program, including the instruction of men new to jobs in ways of working safely.

W. H. Taylor, general superintendent of Coronet; Vernon S. Gornto, safety director for Smith-Douglass; R. M. Wilbur, Coronet general manager; and Gaither Newnam, Coronet safety director.

grow quality with POTASH!

You name the row crop—and you'll find that it grows better, produces more, brings higher prices, when it is supplied with plenty of *available* Potash.

Nature can go only so far in providing vitally needed Potash. Fast-growing, high-producing crops can easily exhaust the available soil supply—and then it's up to you. That's why it's good business to be sure your fertilizer program includes plenty of POTASH—either in your mixed fertilizers or as a supplemental application.

American Potash & Chemical Corporation is a basic supplier of Potash. Consult your fertilizer dealer today and be sure to specify plenty of TRONA® POTASH, *the vitally needed plant food.*

American Potash & Chemical Corporation

TRONA

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE • *and a diversified line of specialized agricultural and refrigerant chemicals.*

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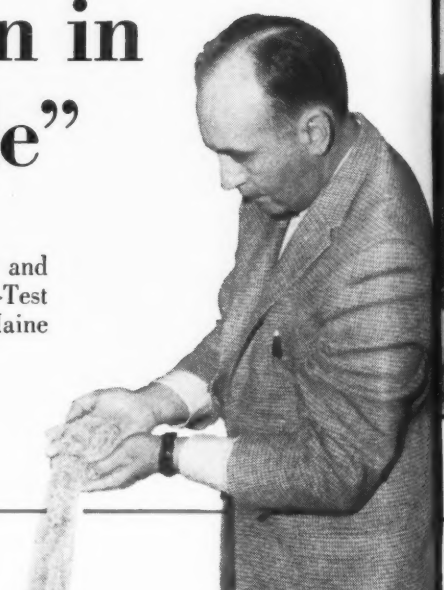
When we checked International's

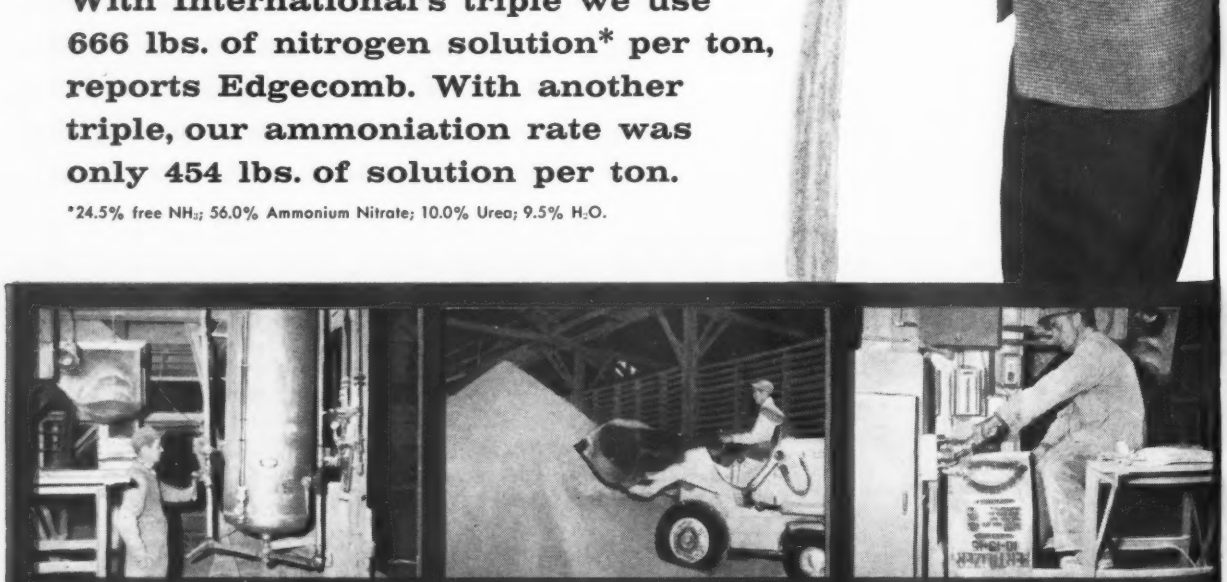
"How to get an extra 212 lbs. of nitrogen solution in each ton of triple"

says Mr. W. R. Edgecomb, Treasurer and General Manager of the Aroostook Hi-Test Fertilizer Company, Presque Isle, Maine



With International's triple we use 666 lbs. of nitrogen solution* per ton, reports Edgecomb. With another triple, our ammoniation rate was only 454 lbs. of solution per ton.

*24.5% free NH_3; 56.0% Ammonium Nitrate; 10.0% Urea; 9.5% H_2O.



A calibrated measuring tank is the heart of Hi-Test's batch ammoniating system. Triple is ammoniated as it is unloaded from rail cars.

Superior ammoniation qualities make International's triple ideal for high analysis fertilizers. Complete ammoniation reduces chance of setting up.

The Hi-Test plant mixes four grades of high analysis fertilizers . . . all sold under the Hi-Test brand name. 80-pound bags are moved by conveyor.

ammoniation rate, we learned

Superior ammoniation qualities are important reasons why Mr. W. R. Edgecomb (left) and Mr. Harry W. Trask, Sales Manager, are satisfied users of International's triple super.

"We learned by experience. Our ammoniation rate proved that International's triple had the superior ammoniation qualities we were looking for," says W. R. Edgecomb, of the Aroostook Hi-Test Fertilizer Company.

"We ammoniate 1500 pounds of International's triple with 500 pounds of nitrogen solution. This gives us a base of 11.1% nitrogen and 35.2% A.P.A."

Compare these results with the ammoniation rate for the triple they previously used — 370 pounds of solution for each 1630 pounds of triple. It's easy to see why International's triple helps this Presque Isle, Maine, firm hold down formulation costs . . . why they are really sold on International.

From the time they receive the triple at their plant siding . . . this highly efficient fertilizer plant operates to take full advantage of the many savings offered by International.

First of all, water shipments to Searsport, Maine, help hold down the cost of the delivered goods. The triple is then shipped by rail to Presque Isle.

Then Aroostook ammoniates the triple from the track. The triple passes through a batch ammoniating system featuring a calibrated measuring tank.

This ammoniating procedure, says Edgecomb, gives them superior results and reduces the possibility of the ammoniated triple setting up. And in addition it gives the material a more desirable granular texture.

What's more, with International's triple they are able to unload a car of nitrogen solution in 1½ days . . . a saving of a full half day. This in turn helps avoid any extra demurrage charges.

This system enables Hi-Test to handle large shipments of triple during the slack season and save on freight. With four men working, they can ammoniate 90 tons of triple (121 tons of base goods) in a normal working day.

If you have not already tried International's superior product — the triple with a guaranteed constant minimum of 46% A.P.A. — put us to the test. You too will become a satisfied customer.

Write or wire International Minerals & Chemical Corporation for full information on prices, shipping and warehousing arrangements.

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FARM CHEMICALS

— *Business & Management* —

ATLAS EARNINGS AND SALES AT RECORD PEAK

Atlas Powder Co.'s net earnings from chemicals and explosives operations rose to 21 per cent in 1956 to a record high of $4,205,992, or $5.61 a common share, Ralph K. Gottshall, president stated recently in the annual report to stockholders. In 1955, earnings totaled $3,480,469, or $4.70 a common share.

Sales and operating revenues of $67,080,045 in 1956 also were at a new high, up 11 per cent from the $60,340,583 reported for 1955.

Present anticipation is that Atlas' 1957 sales will exceed the 1956 level, according to Gottshall. He stated, however, that the added earnings from the higher volume may be largely offset by narrower profit margins.

"We believe," said Gottshall, "that the long-range studies being initiated in our laboratories today will shape the size and profitability of the company for years to come." Research and development expenditures in 1956 were $2,089,000, a 41 per cent increase over 1955.

CSC REPORTS EARNINGS DIVIDEND DECLARED

Consolidated net earnings of $2,830,591, equal to $1.07 per share, is reported by Commercial Solvents Corp. for the year ended December 31, 1956. Sales for the year amounted to $58,745,254.

The firm on Feb. 25 declared a dividend of 25 cents per share on outstanding stock of the corporation, payable March 29 to stockholders of record March 6.

PLAN NEW FACILITIES AT DIAMOND TEX. PLANT

Plans to construct a new plant for production of 50 million pounds of vinyl chloride monomer annually have been announced by Diamond Alkali Co.

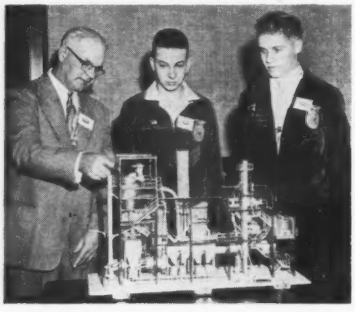
A. L. Geisinger, vice president and general manager of the Plastics Div., said that the new facility will be located at Diamond's Deer Park Plant at Houston, Tex.

The plant will be designed and engineered by Scientific Design Co., Inc., New York. Brown & Root, Inc., of Houston, construction engineers, will build the installation, which is scheduled for completion early next year.

SPENCER IS HOST TO YOUNG CORN FARMERS

Young farmers from Nebraska to South Carolina gathered recently in Kansas City and Memphis to tell how they qualified as "efficiency experts" in the art of growing corn.

The group of 34 represented the top participants in Spencer Chemical Co.'s annual Efficient Corn Growing Program. Held this year in 16 states, the program was climaxed with a three-day expense-paid trip for the entrants judged tops in efficiency. Accompanied by their Vocational Agriculture Teachers, winners from the South were entertained in Memphis, and a week later, those from the Midwest were feted in Kansas City.



Two of the winners, Bob Ehlers and Herman Kraeger, examine a granulation plant model with Bob's father, Otto Ehlers.

To qualify for the trip each participant was required to grow two one-acre plots of corn side by side. On one, he followed the usual corn-growing practices used on his farm. On the other plot he used practices which, in his judgment, would contribute to a more efficient and profitable yield. Average of all the 'new practices" plots harvested by the winners was 114 bushels as compared to 74.6 bushels for the "old practices" plots.

SWEDESBORO SITE FOR LIQUID FERT. PLANT

Contracts have been awarded for construction of a complete plant for the manufacture of liquid fertilizer in Southern New Jersey, reports Delaware Valley Chemical Corp. The plant will be located in Swedesboro, off Auburn Road and Locke Avenue. Construction is under the direction of C. B. Coleman, Oakland, Calif.

The new Delaware Valley Chemical plant will manufacture nitrogen solutions and complete neutral mix fertilizers. Distribution to the Southern New Jersey farm market will be through local dealers and distributors. Vincent Vasta & Sons and Vasta Lumber Co., Swedesboro, have been named as distributors.

COURT OKAYS TEXAS CITY REORGANIZATION

The United States District Court for the Southern District of Texas has confirmed a plan for the reorganization of Texas City Chemicals, Inc., under which Smith-Douglass Co., Inc., will become its sole stockholder.

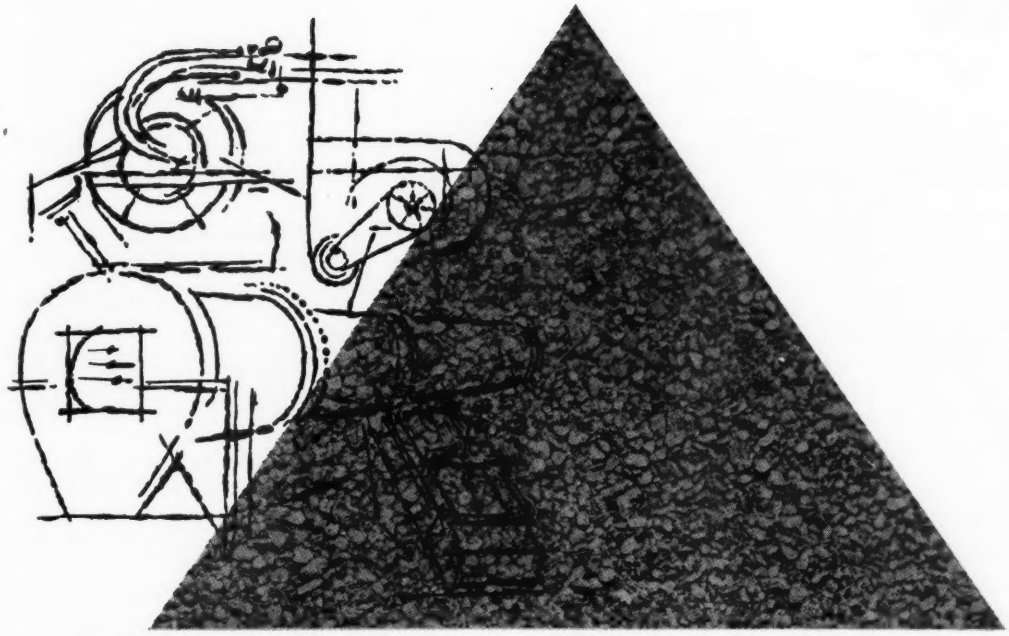
Texas City Chemicals, Inc., will produce sulfuric acid, phosphoric acid, feed grade dicalcium phosphate, fertilizer grade dicalcium phosphate, high-analysis pelleted fertilizers manufactured on the monoammonium phosphate principle, liquid base fertilizer solutions and other plant food and chemical products.

RAUH & SONS TO EXPAND PLYMOUTH FACILITIES

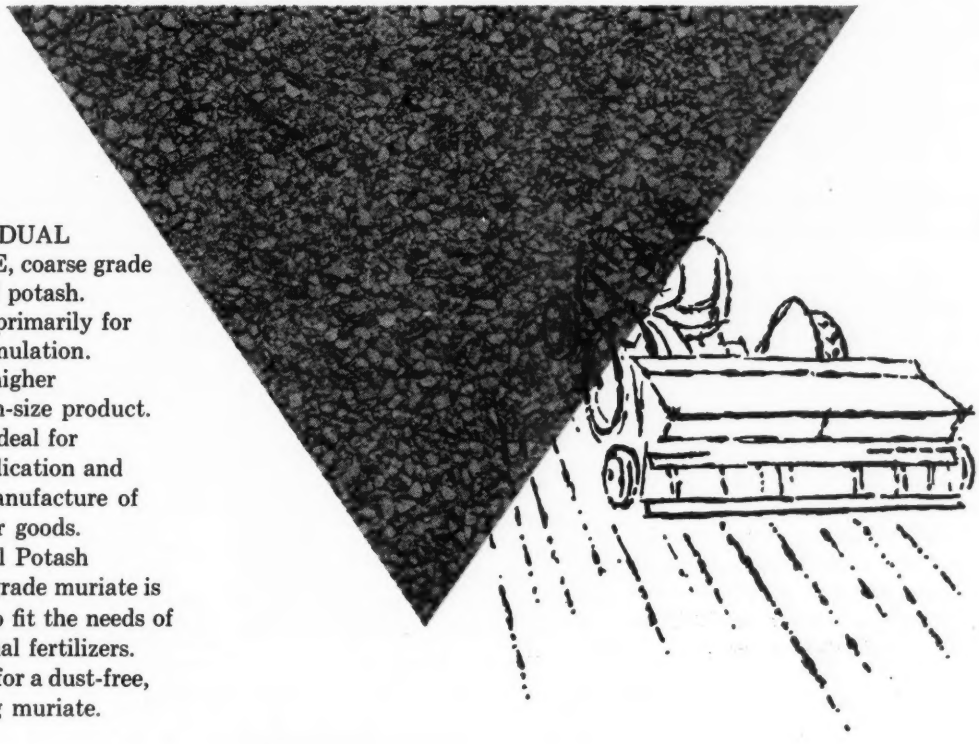
E. Rauh & Sons Fertilizer Co., of Indianapolis, Ind., is reported to be planning a two-step expansion program in Plymouth, Ind.

Plans are to manufacture pelleted fertilizer, which up to this time had been shipped to Plymouth in bulk from Indianapolis and bagged there for distribution in the area.

Second step in Rauh's expansion program calls for erection of a superphosphate plant just north of the present main building at Plymouth.



LET NATIONAL POTASH SERVE YOU



Here is a DUAL PURPOSE, coarse grade muriate of potash. Designed primarily for use in granulation. It gives a higher yield of on-size product. It is also ideal for direct application and for the manufacture of top dresser goods.

National Potash standard grade muriate is designed to fit the needs of conventional fertilizers. Processed for a dust-free, non-caking muriate.

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FARM CHEMICALS

— *Business & Management* —

MICHIGAN & MURPHY OPERATE NEW PLANT

A new bromine plant has just been placed in operation at El Dorado, Ark. The facility is a joint venture of Michigan Chemical Corp. and Murphy Corp.

Michigan Chemical said it expected to maintain the price level in effect at the end of 1956 as encouragement to wider use of bromine by chemical manufacturers.

PGH. COKE REPORTS RECORD SALES, EARNINGS

For the second successive year Pittsburgh Coke & Chemical Co. set new records in sales and earnings, according to the firm's annual report. Sales reached $59,678,000 for the year ended Dec. 31, 1956, compared with $56,572,000 in 1955.

Earnings for 1956 rose to $3,921,000, 27 per cent ahead of the previous record earnings of $3,093,000.

Consolidation of the firm's agricultural chemicals division with Chemagro Corp. was completed in 1956, the officers pointed out. In its first full year on the new basis, Chemagro—which is controlled jointly by Pittsburgh Coke and Farbenfabriken Bayer of Germany—operated at a "gratifying and profitable" level.

NEW HIGH FOR AP&CC SALES AND EARNINGS

Sales and earnings of American Potash & Chemical Corp. surpassed all previous records in 1956, according to the firm's president, Peter Colefax.

Net sales during 1956 reached $41,750,628, as compared with $27,731,612 the preceding year, a 50 per cent increase.

Net income was $5,103,091, a 26 per cent increase over the $4,060,192 reported for 1955. After preferred dividends, 1956 earnings were equal to $2.64 a share on the 1,847,554 Class A and Common shares outstanding on Dec. 31.

Highlights of the year reported by Colefax included improvement in operating efficiencies at each of the company's plants, increased production facilities and expansion of the research program.

READE MFG. BUILDS TEXARKANA FACILITIES

Reade Manufacturing Co. of Jersey City, N. J., is reported to be building a new herbicide plant at Texarkana, Tex, North of International Minerals & Chemical Corp.'s facilities there.

Weedkillers made in the new plant will be utilized by railroads in the Southwest area, according to C. H. Reade, president of the company.

INCORPORATIONS

Farmers Exchange, Inc., Franklinton, La., has been granted a charter of incorporation to manufacture and sell fertilizer, farm equipment, seeds and feed. Capital stock is listed at $10,000.

MICH. CHEM INCREASES BOTH SALES & PROFITS

Increases in both profit and sales were reported by Michigan Chemical Corp. for 1956. Operating profit amounted to $356,402 after allowance of $55,000 for Federal income taxes. This compares with 1955 profit of $341,314.

Sales totaled $6,640,796 for the year, an increase over the $6,526,275 sales reported in 1955. Considerably higher sales are expected this year.

"During the year further progress was made in strengthening the research and development programs of the corporation," said Theodore Marvin, president, in his letter to stockholders. "A new laboratory has been built, special scientific equipment installed and the staff has been materially expanded. Research expenditures for 1956 were the highest in the history of the corporation, and further increases are contemplated for 1957."

AP&CC TO BUILD SODIUM CHLORATE PLANT IN MISS.

American Potash & Chemical Corp. will build a $5 million chemical manufacturing plant at Aberdeen, Miss. for production of sodium chlorate, according to a recent announcement.

Construction is scheduled to begin immediately at a 586-acre site on the Tombigbee River seven miles outside of Aberdeen, with completion slated for mid-1958. Initially, production will be at the rate of 15,000 tons of sodium chlorate per year.

Aberdeen was chosen as a site because of low-cost electric power available from Tennessee Valley Authority and because of Aberdeen's strategic location in the heart of the expanding southern pulp and paper industry, says APLCC. When the plant is in production, AP&CC believes it will be the largest sodium chlorate producer in the western hemisphere.

After six days of gibberellic acid treatment in Lilly labs, the peas at left outgrow untreated plants at right by four inches.

Subject: GIBBERELLIC ACID

For the past few years, Lilly has studied the effect of gibberellic acid on plants and seeds. Some of the work now underway is shown on these pages. The results are promising and the work has been intensified.

Our research shows that this remarkable compound can increase growth, speed germination, induce flowering, break dormancy and cause certain other beneficial actions. Our development teams are compiling important data concerning the nature of gibberellic acid and its characteristics in product formulation and use.

Since September of 1956, we have been able to supply research samples to more than 300 other scientific groups. As one of the major basic manufacturers of fermentation products, we expect to produce an adequate and dependable supply to meet the growing demand for gibberellic acid products. It is our intention to make these products available as rapidly as necessary research and development will allow.

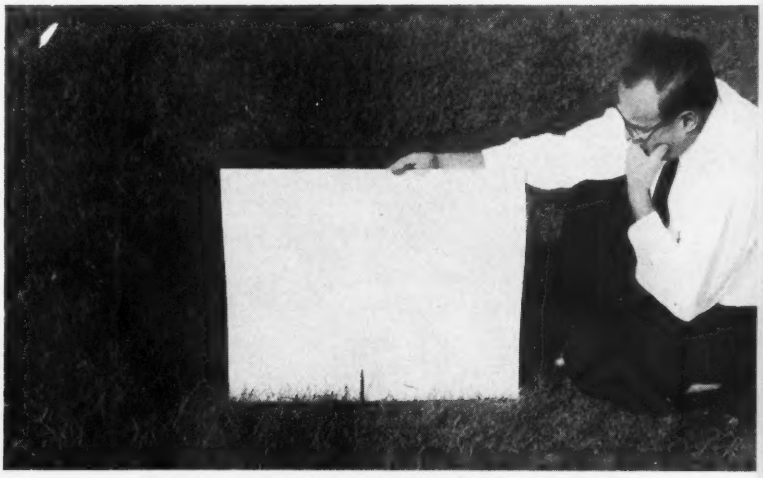
AGRICULTURAL & INDUSTRIAL Lilly PRODUCTS DIVISION

ELI LILLY AND COMPANY, INDIANAPOLIS 6, INDIANA

Field plots at the Lilly Agricultural Research Center have been the site of extensive gibberellic acid studies. Here the material is being tested under field conditions with careful measurement of results throughout the growing season.

Flowers and ornamentals are treated in Lilly test plots to gauge the effect of the gibberellic acid compound on flowering, stem length, color, etc. Minute quantities have been found effective and can be applied by several different methods.

A Lilly scientist checks growth and production of field and vegetable plants in the test plots which have been sprayed with gibberellic acid. Results indicate possible use in numerous crops and also in the growing and treatment of many seeds.



Turf plots at Lilly indicate that gibberellic acid causes grasses to grow faster and longer. Even in mid-November the treated plot at the left, after one spraying, had a greener appearance than the untreated grass at the right.

Lilly development teams test gibberellic acid to determine its characteristics in combination with other materials and under a variety of heat, light and moisture conditions. A number of forms of the material are studied for different needs.

Gibberellic acid is the product of a fermentation process which has long been used at Lilly's. As a major basic producer of fermentation products, Lilly has assigned a part of these large-scale facilities to gibberellic acid production.

FARM CHEMICALS

Business & Management

BUTCHER COMPLETES PORTLAND DUST PLANT

L. H. Butcher Co. announces that construction and installation of its insecticide dust plant at Portland, Ore., now is completed.

Hanson

Lee R. Hanson is manager of the agricultural chemicals department for the Pacific Northwest, Oregon, Washington and Idaho. His assistants are W. B. Radey, Portland, and Hewitt H. Harrison, Seattle.

NEW PLANT FOR JASPER CO. CO-OP

Jasper County Farm Bureau Co-Op this month is expected to begin operation of its new liquid and bulk fertilizer plant in Kersey, Ind., according to a recent report.

HOPEWELL AMM. NITRATE UNIT BEGINS PRODUCTION

Nitrogen Div., Allied Chemical & Dye Corp., has begun producing ammonium nitrate fertilizer in new facilities at its Hopewell, Va., plant.

The company has been making liquid ammonium nitrate and other nitrogen solutions for a number of years. In the new facilities, liquid ammonium nitrate is dehydrated, pebbled, coated, bagged and shipped. Shipment is by rail and truck in 80 and 100-pound bags.

The new unit, designed by Nitrogen Division's Development Department at Hopewell, will employ between 70 and 100 men, depending on the season.

FREEPORT'S SULFUR OUTPUT, SALES ARE HIGHEST EVER

Production and sales of sulfur by Freeport Sulphur Co. in 1956 were the highest in the company's history, Langbourne M. Williams, chairman and president, announced in the 44th annual report to stockholders.

Net earnings, dividends and net assets also increased to new records. Earnings were $13,377,585 or $5.35, as previously reported on a preliminary basis, compared to $12,401,058, or $4.96 per share, in 1955.

V-C DECLARES DIVIDEND

Directors of Virginia-Carolina Chemical Corp. have declared a quarterly dividend of $1.50 a share on 213,032 shares of 6 per cent cumulative preferred stock. The dividend was to be paid April 1 to holders of record March 13.

WESTVACO EXPANDS CHARLESTON PLANT

A multimillion dollar solvent expansion program is being undertaken at Food Machinery & Chemical Corp.'s largest chemical installation, the Westvaco Chlor-Alkali Div. plant at South Charleston, West Va. Franklin Farley, division president, said recently that the expansion involves carbon bisulfide and carbon tetrachloride.

Engineering work on the solvent expansion program already has begun. This program is part of an overall plan to renovate and enlarge most of Westvaco's South Charleston facilities. Other phases include the entirely new ammonia plant completed in late 1955 and rebuilding of the chlorine plant now in progress.

DUPONT 1956 EARNINGS, SALES DOWN FROM '55

Sales, earnings and dividends of DuPont Co. in 1956 were second highest in the company's history, exceeded only by record highs established in 1955, Crawford H. Greenewalt, president, disclosed last month in his annual report to stockholders.

Sales were $1,888 million, or one per cent lower than in 1955, while physical volume of sales was about 3 per cent higher. Net earnings from operations decreased 13 per cent from 1955, totaling $8.20 per share of common stock, as compared with $9.26 in 1955.

CALENDAR

April 2. Western Agri. Chem. Assn., Hotel Biltmore, Los Angeles, Calif.

April 7-12. American Chemical Society meeting, Miami, Fla.

April 8-12. Chemical Progress Week.

April 14-15. Fifth annual Calif. Fertilizer Conf., sponsored by the Soil Improvement Committee, Calif. Fert. Assn., Fresno State College, Fresno.

May 13-15. Carolinas-Virginia Pesticide Formulators Assn. spring convention, Cavalier Hotel, Virginia Beach, Virginia.

May 20-22. Chemical Specialties Manufacturers Association, Mid-Year Meet. Drake Hotel, Chicago.

June 6-8. Manufacturing Chemists' Association Annual Meeting. Greenbrier Hotel, White Sulphur Springs, W. Va.

June 9-12. National Plant Food Institute, annual meet. Greenbrier Hotel, White Sulphur Springs, W. Va.

June 17-19. 15th Convention, Assn. of Southern Feed and Fert. Control Officials, Dinkler-Tutwiler Hotel, Birmingham, Ala.

June 23-26. American Society of Agr. Engineers Annual Meeting, Mich. State Univ., East Lansing.

June 26-28. Eighth Annual Fert. Conf. of Pacific N. W., Benson Hotel, Portland, Ore.

July 10-14. Plant Food Producers of Eastern Canada Convention, Manoir Richelieu, Murray Bay, Que.

July 17-19. Southwestern Fert. Conf. and Grade Hearing, Galvaz Hotel, Galveston, Tex.

Oct. 2-4. Annual Beltwide Cotton Mechanization conference, Shreveport, La.

Nov. 3-5. 34th annual convention, California Fertilizer Association, St. Francis Hotel, San Francisco.

Dec. 11-13. Agricultural Ammonia Institute annual meeting, Hotel Marion, Little Rock, Arkansas.

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Cyanamid gives you at-the-mine order service that cuts demurrage, delivers phosphate rock when you need it... as you need it!

No side-tracking of orders in "head" or "branch" offices when you call, wire or write Cyanamid. Your order goes direct to point of shipment, Brewster, Florida, for immediate processing.

Our traffic experts are experienced at routing to eliminate avoidable delay... another service that cuts demurrage, yet keeps your plant humming.

Cyanamid's Technical Staff is on call whenever you need it. Let us help you solve knotty manufacturing problems. Call or write for this free service.

As for grade... all our production is high grade, ranging from 77% B.P.L. down to 72% B.P.L. Our rock is quality controlled by specialists and blended to your specifications. Rock is also ground to order and a screen analysis of each car sent to the customer before shipment.

Why not call us today? American Cyanamid Company, Phosphates and Nitrogen Division, 30 Rockefeller Plaza, N. Y. 20, N. Y.

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PRODUCERS OF: Aero® *Cyanamid: Fertilizers—Defoliants—Herbicides* Aeroprills® *Ammonium Nitrate Fertilizer*
Aero® *Ammonium Sulphate* Amanol* *Nitrogen Solutions* Cyanogas® *Calcium Cyanide Fumigants* Anhydrous Ammonia
Phosphates for Acidulation and Direct Application Thiophos® *Parathion Technical* *Malathion Technical* HCN *Fumigants*
*Trade-mark

FARM CHEMICALS People

American Agricultural Chemical Co. D. S. Parham has become responsible for all production activities of the firm, except the Phosphate Rock Mines, as general superintendent of production. His duties include supervision of chemical and elemental phosphorus production in addition to fertilizer production.

W. H. Phillips, formerly located at the firm's Detroit, Mich., office, has been named assistant manager of the Cincinnati, O., sales office.

Research and Process Development Dept. additions: James A. Taylor, former head of the department of chemical and metallurgical engineering at Wayne University, Detroit, has been named research chemical engineer. Bernard Buchner, former senior organic chemist for Koppers Co., is new research organic chemist for AAC Co.

American Potash & Chemical Corp. Ralph N. Hoh has been appointed western sales manager of industrial chemicals for American Potash & Chemical Corp., according to an announcement by William M. Clines, western general sales manager. Hoh will be in charge of western sales of soda ash, salt cake, phosphoric acid, sodium and potassium chlorate, manganese dioxide and sulfur dioxide.


Hoh

California Spray-Chemical Corp. has appointed Dwight Worsham foreign sales representative, Foreign Dept. In this position, Worsham will act as technical advisor for Ortho distributors in South America. He will make his home in Caracas, Venezuela.

Commercial Solvents Corp. Two new vice presidents have been elected—J. F. Dudley to head the firm's production and engineering activities, and Dr. Graham W. McMillan, who will be responsible for the research and development program and operation of CSC's Central Research Laboratories at Terre Haute, Ind.


Dudley


McMillan

W. Ward Jackson, vice president, has been named to head the firm's sales and marketing activities. In addition to overall sales, Jackson's new responsibilities include the company's advertising and sales promotion, market development and traffic activities.


Jackson

James V. O'Leary has been named general sales manager for Commercial Solvents Corp. His responsibilities include sales of all the company's products which are marketed through the five departments, the company reports.

Since he joined CSC in 1927, O'Leary has been manager of the Midwest Regional sales organization and manager of the Detroit, Mich., district office.


O'Leary

Connecticut Chemical Research Corp. Charles O. Rader is named sales manager, Contract Packaging Div. Rader has been with Lever Brothers, Koppers Co., Bridgeport Brass Aerosol Div. and Bostwick Laboratories, Inc.


Rader

Diamond Alkali Co. Promotion of Jack E. Davis to special staff assistant in the Sales Dept. is announced. Davis goes to his new position after nearly 11 years' experience as a member of the company's Philadelphia branch sales staff.

Diamond Black Leaf Co. New manager of manufacturing operations for DBL is Charles C. Yent, of Richmond, Va. A veteran of 16 years' experience in agricultural chemicals development, research and formulation, Yent will be responsible for engineering and production.

Dow Chemical Co. Walter Miller is named field specialist in agricultural development in the five-state area including Alabama, Louisiana, Mississippi, Arkansas and Tennessee. With headquarters in Greenville, Miss., he will be engaged in research and develop-


Miller

FERTILIZER + GRAFLOW T.M.
= A BETTER, MORE FLOWABLE FERTILIZER IN THE FIELD

- Reduces corrosion in mixing and handling equipment!
- Improves fertilizer flowability!
- Speeds cleanup of mixing equipment by minimizing residual buildup!
- Mixes and coats evenly; isolates each fertilizer particle!
- Increases sales of your fertilizer by improving its drillability and reducing caking!
- Cuts wear on both mixing and farming machinery!

227

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GRAPHITAR® CARBON-GRAPHITE • GRAMIX® • SINTERED METAL PARTS MEXICAN® GRAPHITE PRODUCTS • USG® BRUSHES

ment work on insecticides, soil fumigants and commodity and space fumigants.

Escambia Chemical Corp. A. N. Wohlwend, director of commercial development, was appointed vice president by the board of directors at a recent meeting.

Erhart K. Drechsel has joined Escambia's New York staff. He will devote full time to commercial development activities. Drechsel goes to Escambia from American Cyanamid Co., where he was a product manager in their New Product Development Dept.


Drechsel

Ethyl Corp. announces appointment of C. George Krieger as special assistant to James E. Boudreau, director of public relations.

Etiwan Fertilizer Co. James G. Gibbs has been elected president, succeeding the late W. R. Sullivan of Atlanta, Ga. Gibbs was formerly vice president of the firm.

Freeport Sulphur Co. Following resignation of John Hay Whitney as chairman of the board, Langbourne M. Williams was elected chairman to succeed him. Whitney resigned as chairman and as a director immediately after Senate confirmation of his nomination as Ambassador to the Court of St. James's in London. Williams will continue to serve also as president.

Grace Research and Development Div., W. R. Grace & Co. Gerald J. Bayern, former senior market analyst for Allied Chem. & Dye Corp.'s Barret Div., has been named manager of market research for the Grace division. Dr. Thomas R. Steadman has been named manager of the division's miscellaneous organic chemicals group. He goes to Grace from National Research Corp.

Fern Wood Mitchell, who joined Grace in December, 1955, has been named manager of the research services group. Dr. Mitchell was chief analytical chemist at American Cyanamid Co.'s Fortier plant from 1953 to 1955 and earlier was a research chemist for General Aniline and Film Corp. at Easton, Pa.

Grand River Chemical Division, Deere & Co. announces appointment of Earl Straub as sales representative in Missouri and surrounding area. Since graduating from Missouri University in 1941, Straub has served as a county agent, operated his own farm and worked in the Administrative Dept. of the Missouri State Department of Agriculture.

Hayes-Sammons Chemical Co. is building a new agricultural chemical formulating plant and sales office in Indianola, Miss. Andy N. White, entomologist and sales manager of the Chemical Div. at the Mission, Tex., office for the past five years, has been transferred to Indianola to be general manager of the Delta Div. plant and sales. Arthur E. Smith, Jr., will be production superintendent.

Hooker Electrochemical Co. William L. Gillespie becomes manager, sales administration, with headquarters in Niagara Falls. John T. Walmsley succeeds Gillespie as manager, Chicago district sales, operating from the company's Chicago sales office.

The company's controller, Thomas F. Willers, in addition has been named assistant treasurer.

International Minerals & Chemical Corp. has appointed Thomas A. Bruns area sales manager for the Phosphate Minerals Div. He will be responsible for sales of phosphate rock for agricultural and industrial uses in northern United States and eastern Canada.

Bruns joined IMC 10 years ago and prior to his new assignment was in the Export Dept. as manager of sales in the Far East.


Bruns

Monsanto Chemical Co. Charles A. Leonard of St. Louis, farm chemicals sales representative, has been transferred to Camp Hill, Pa., to handle the sale of Monsanto-labelled farm chemicals in a 13-state eastern territory. He will be responsible for obtaining distribution of the weed killers and insecticides formulated by the company's Organic Chemicals Div.


Leonard

Naugatuck Chemical Div., U. S. Rubber Co. executive staff changes: Earle S. Ebers, former general sales manager, is named assistant general manager for the division. Harold M. Parsekian, who was assistant general sales manager, becomes general sales manager. George R. Vila is newly elected vice president of U. S. Rubber. He has been named general manager of the Naugatuck Div., succeeding John E. Caskey, who has retired after 42 years with the firm.

Olin Mathieson Chemical Corp. Dr. Arthur M. Smith, assistant to the vice president, will direct the anhydrous ammonia program of the Plant Food Div. His headquarters will be in Little Rock, Ark.


Smith

FOREST PRODUCTS DIV. James

POTASH RAISES FARM INCOME. The successful American wheat farmer. He knows all there is to know about plowing, planting and harvesting. He knows the value of potash-enriched fertilizers, too. If he cared to talk about his success, he'd probably tell us he replenishes the potash in his soil every year. And every fall, like clockwork, he reaps the full healthy crop that is his due. Chances are he spends no more time in the field than any other farmer. A little wiser, that's all.

USP's Higrade muriate of potash is free-flowing and non-caking and has the highest K_2O content—62/63% K_2O. Also available, USP's Granular muriate of potash contains a minimum of 60% K_2O.

SUNSHINE STATE POTASH A PRODUCT OF NEW MEXICO U.S.A.

REG. U. S. PAT. OFF.

UNITED STATES POTASH COMPANY

DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION

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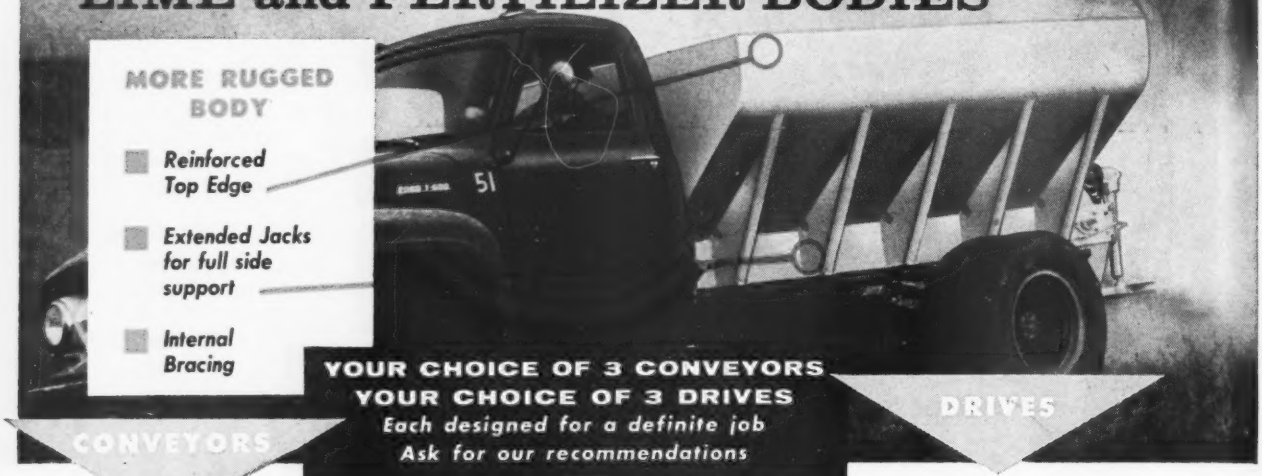
NEW BAUGHMAN

Compare Quality and Prices . . .

THE NEW *BAUGHMAN* K-5

LIME and FERTILIZER BODIES



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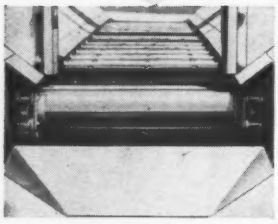
YOUR CHOICE OF 3 DRIVES
Each designed for a definite job
Ask for our recommendations

CONVEYORS

DRIVES



DRAG CHAIN CONVEYOR

20" wide. New, heavy duty —having two 20,000 lb. test malleable block chains, welded together with 4" spaced cross drags.

CHAIN BELT CONVEYOR

12" wide. Provides even flow of material to distributor. Links tend to break up small lumps, eliminating endgate plugging. Requires no shields, compartments or chokes. Positive sprocket drive.

BELT CONVEYOR

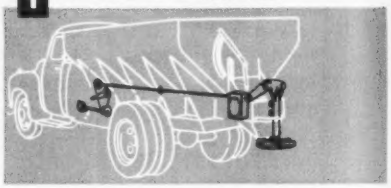
20" wide. Provides smooth even flow of material, even in smallest quantities. Double corrugated drum drives give more belt pull. Needs at least one compartment to ease load on belt. For dry material.

1 Power-take-off driven Distributor and Power-take-off driven Conveyor Drives direct to heavy 44-1 sealed gear case, mounted left or right, and by short #60 chain to distributor case. Has two speeds on conveyor and distributor. (High) for Lime; (Low) for Fertilizer. Has 1-3/16" drive shafts. All bearings sealed against fertilizer.

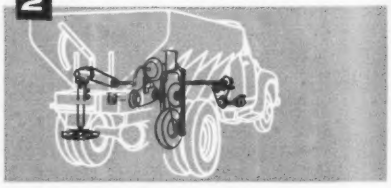
2 Power-take-off driven Distributor and Ground drive Conveyor. Drive can be mounted left or right. Has two speeds. (High) for lime and (Low) for fertilizer. Patented Baughman Ground drive Conveyor gives an even discharge of material in any gear or speed of travel. (Actually Ground Driven.) GC Models have SPREADING CHART showing accurate endgate settings for volume.

3 Hydraulic motor which drives Distributor is powered by hydraulic pump on power-take-off. Baughman Ground drive powers Conveyor.

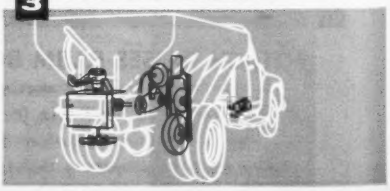
1 PD-PC DRIVE



2 PD-GC DRIVE



3 HD-GC DRIVE



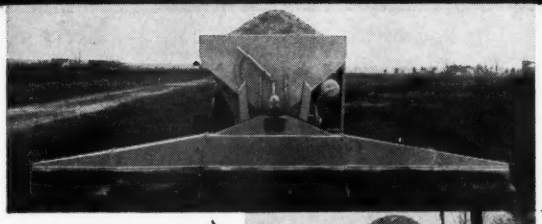
BAUGHMAN
HI-SPEED SPREADING AND CONVEYING EQUIPMENT
AROUND THE WORLD

BAUGHMAN

The pioneer and largest manufacturer by far of lime and fertilizer spreading equipment.

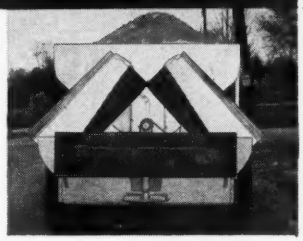
SPREADERS

WE HAVE NO COMPETITION!



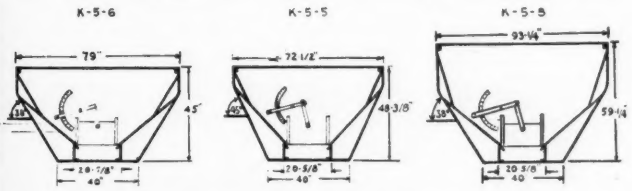
MODEL 235 ATTACHMENT SPREADER

(Optional) Holds material close to the ground. Photo shows open position (less than 8') for highway travel.

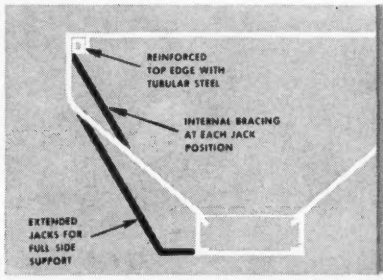


Rugged on top! Durable on the side! The rolled top edges are reinforced with 2" square tubular steel, protecting the body from denting by end loaders and shovels. Welded external jacks provide full-length reinforcement and support of body. Welded internal bracing in same positions provides full load strength under all operating conditions. Strongest body ever built!

Body styles and widths available in Chain Drag and Belt Conveyor Models.



Chain Belt Conveyor Models also available in three sizes with 12⅝" Endgate and 8" narrower body.



STRONGEST SPREADER BODY EVER BUILT!

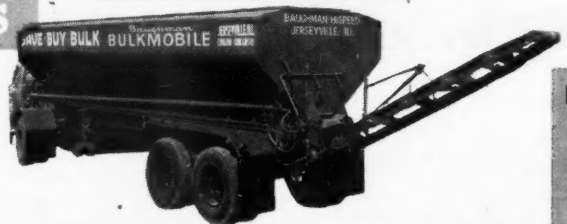
CHECK THESE LOW PRICES!

EXAMPLES

10' MODEL K-5 CHAIN PD-PC Drive —		10' MODEL K-5 CHAIN PD-GC Drive —		10' MODEL K-5 CHAIN HF-GC Drive —	
Power-take-off driven Distributor		Power-take-off driven Distributor		Hydraulic driven Distributor	
Power-take-off driven Conveyor		Ground drive Conveyor		Ground drive Conveyor	
Body Price	$544.50	Body Price	$544.50	Body Price	$544.50
Drives	$302.50	Drives	$605.00	Drives	$1270.50
TOTAL	$847.00*	TOTAL	$1149.50*	TOTAL	$1815.00*
235 Attachment	$223.85		$223.85		$223.85

*Power-Take-Off, Freight, Mounting and Taxes to be added. Prices F.O.B., Jerseyville, Illinois.

Prices on Belt Chain and Belt Conveyors available on request. All models, except chain belt, available with single or double distributor.



Heavy Duty BULKMOBILE. Huge Capacity (740 Cu. Ft. Cap. shown here). Full hydraulic or gas engine operation with hydraulic conveyor. Ideal as "parent" body for feeding spreaders in the field. All sizes.

DEALERS WANTED IN SELECTED AREAS

For further details WRITE TO:

J. E. CADLE, Sales Manager
Baughman Manufacturing Co., Inc.
160 Arch Street
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Manufacturing Co., Inc. JERSEYVILLE ILLINOIS

You'll see more Baughmans on the highway than all other makes!

FARM CHEMICALS People

D. Griggs has been named southern district sales service manager for kraft paper and bags.

INDUSTRIAL CHEMICALS DIV. W. D. Marshall, former Philadelphia district manager, is assigned to special sales duties. He is succeeded at Philadelphia by J. G. Johns. Victor C. Fusco has been appointed sales representative in Pittsburgh, and Don Threlkeld, sales representative in the Chicago office.

Pennsylvania Salt Mfg. Co. of Wash. Appointment of William S. Formwalt as assistant to the vice president was recently announced. Formwalt had been with Davison Chemical Co., working in sales particularly related to sulfuric acid and phosphate rock.

Panogen, Inc. New vice president is Charles M. Hutchinson.

Hutchinson

Since joining Panogen in 1950, he has served as sales manager for the firm and will continue in this capacity, Petrus Hellman, company president reports.

Sinclair Chemicals, Inc. announces appointment of Earl Noblet as assistant manager of market development. Noblet previously was engaged in market research activities. He joined Sinclair in 1954 after five years' experience in research and development of organic intermediates and nitrogen chemicals.

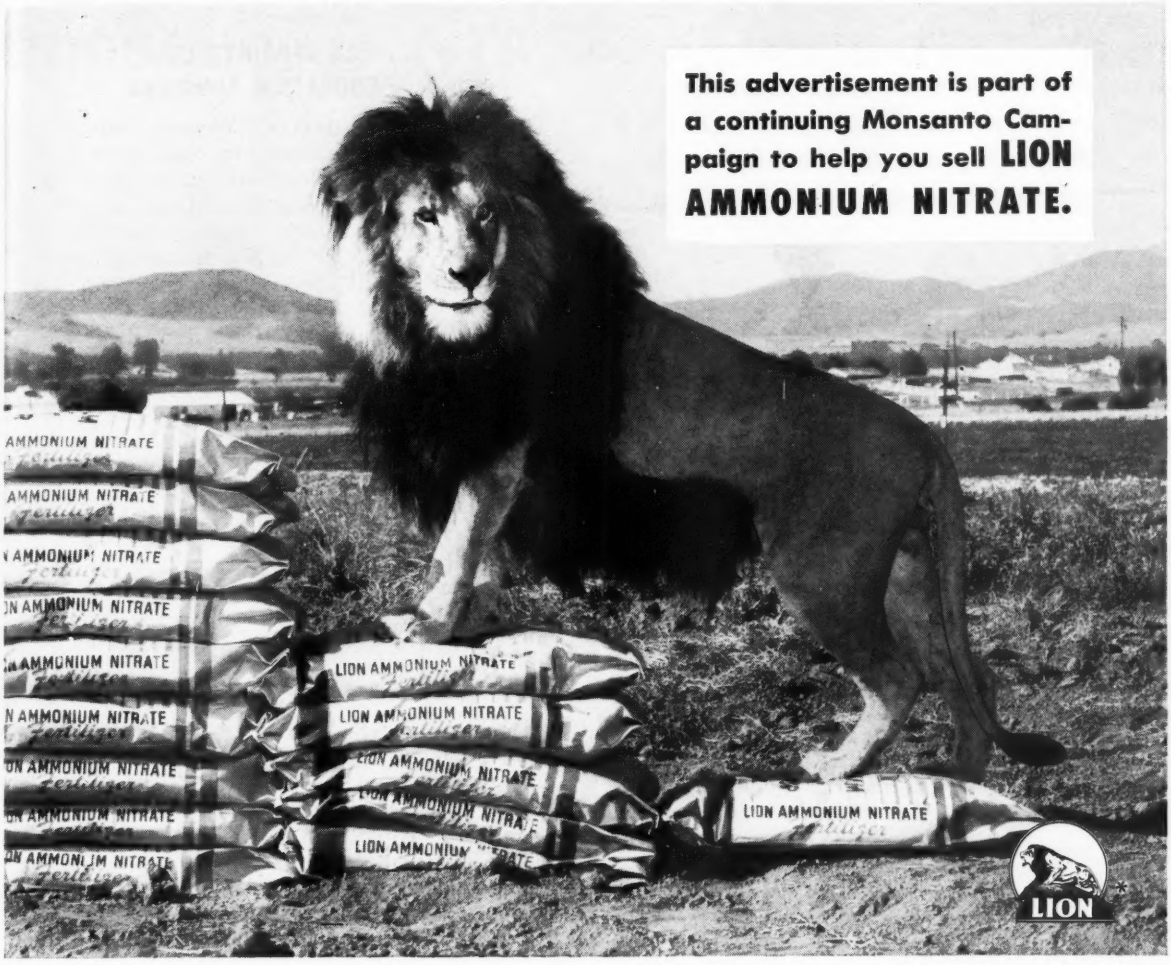
Noblet

Smith-Douglass Co. Russell E. Spivey, former manager of Smith-Rowland Co., who recently served in a sales capacity with Smith-Douglass, has been named manager of wholesale sales and raw materials procurement.

The Texas Co. Frederic H. Holmes, vice president in charge of the Research and Technical Dept., has announced appointment of Dr. Gerhard Herzog as an assistant general manager of the department.

Witco Chemical Co. Herbert Schoenfield is named to the newly created position of manager, polyester sales in the firm's Chemical Sales Division. Formerly technical sales service manager for Witco's Emulsol Chemical Corp., Schoenfield will make his headquarters in Chicago.

Schoenfield



You save money with LION in your fields

LION BRAND AMMONIUM NITRATE IS MORE ECONOMICAL THAN NITRATE OF SODA OR AMMONIUM NITRATE–LIMESTONE CARRIERS

FOR LOW-COST NITROGEN, LION Ammonium Nitrate is the brand. Guaranteed to contain 33.5% nitrogen, LION is . . .

- **Far more economical** than nitrate of soda, which contains only 16% nitrogen. You get more than *twice as much* of the valuable plant food, nitrogen, in every bag of LION brand Ammonium Nitrate than you do in any bag of nitrate of soda.
- **A better buy** than 20.5% ammonium nitrate–limestone carriers, LION gives you *better than* 50% more nitrogen in every bag.

FOR EASIER SPREADING, Lion Ammonium Nitrate is in pellet form. These pellets are specially coated to withstand caking . . . then packed in specially lined, moisture-resistant bags. Result: LION brand is *guaranteed* to flow freely—*not for just a year, but until used*—when you follow storage directions on the bag.

3 EASY STEPS TO GET *ALL* THE FEEDING-POWER YOUR CROPS NEED

1. TEST YOUR SOIL to see what kinds and amounts of fertilizers are needed. Your local farm authorities will help.

2. ORDER WHAT YOU NEED of mixed fertilizer and Lion brand Ammonium Nitrate from your fertilizer dealer. When you buy LION, you get top-quality, low-cost nitrogen fertilizer *guaranteed* to flow freely; *guaranteed* to contain 33.5% nitrogen.

3. APPLY THE FULL AMOUNT of mixed fertilizer and Lion brand Ammonium Nitrate soil tests indicate. Don't skimp—fertilizer is the least expensive item you use for crop production.

GROW MORE PROFITABLY . . . Weed Killers • Brush Killers • Parathion Insecticides • Meta-Green® to keep silage fresh • Phosphates (liquid and solid) • LION Sulphate of Ammonia • Anhydrous Ammonia.

MONSANTO

MONSANTO CHEMICAL COMPANY • Inorganic Chemicals Division • St. Louis 1, Mo.

KANSAS PESTICIDE CONF. DRAWS 175 PERSONS

Though only 75 were expected, 175 persons attended the first state pesticide dealer and custom applicator conference at Kansas State College last month, Chris C. Burkhardt, conference chairman reports.

Burkhardt said the estimated $8.5 million damage to alfalfa by spotted alfalfa aphids in Kansas during 1956 and increased damage to field crops by insects during the '56 drouth may have accounted for the high interest in pesticides.

In attendance were pesticide dealers, custom ground and aerial applicators, pesticide formulators, county weed supervisors and county agents.

The program included talks on weeds, insects and nematodes by specialists from Kansas State College, the state Board of Agriculture and USDA's Agricultural Research Service. There were discussions on how to use pesticides safely, how to control weeds and brush in fields and pastures, reports of research on spotted alfalfa aphids and corn earworms in grain sorghum and a forecast of the insect situation for 1957.

PNPFA BOARD MEETING HELD IN PORTLAND

The Board of Directors of the Pacific Northwest Plant Food Association met March 13 at the Multnomah Hotel, Portland, Oregon, to consider current association business, reports Leon Jackson, secretary. Also on the agenda was election of a new board member to replace Robert Allard, who recently resigned, since a change in position made him ineligible to serve.

GEORGE G. CHANCE NEW NCC PRESIDENT

George G. Chance of Bryan, Tex., has been named president of the National Cotton Council. He succeeds Col. Francis J. Beatty, who becomes chairman of the board of directors.

A member of the Committee or Organization, Chance has served continuously on the board of directors of the council since 1941.

TRADE SHOWS VICE PRESIDENT ELECTED

Edward F. Arenz has been elected to the new position of vice president—trade shows of Garden Supply Merchandiser, Inc. He had been secretary-treasurer and director of trade shows.

Arenz joined the Merchandiser early in 1953 as advertising production manager. In October of that year, he was named secretary-treasurer and in June, 1956 accepted the added responsibility of director of trade shows.

MCA APPOINTS TWO EDUCATION ADVISORS

Elbert C. Weaver, instructor in chemistry on the George Peabody Foundation at Phillips Academy, Andover, Mass., has been appointed senior education advisor for the Manufacturing Chemists' Association. The group also announced appointment of Dr. James K. Hunt, formerly of DuPont Co., as education advisor.

Both men will assist in developing and executing MCA's expanding aid-to-education activities, devoting special attention to work on the program for teachers and students of senior high school chemistry.

Weaver will serve on a part-time basis for the present.

BUSINESS FORECASTING STUDIED BY AMA

Consumer buying power in the economy as a whole is the principal economic indicator used in business forecasting, according to an American Management Association survey released recently.

More of the companies included in the study—whether their products are industrial goods, services or consumer goods—watch consumer buying power than any other single indicator. And most of the responding executives rank it even higher than trend figures in their own industry, AMA reports.

Next to consumer buying power, the survey respondents give the most attention to trends in their own industries—purchases, sales volume and the like.

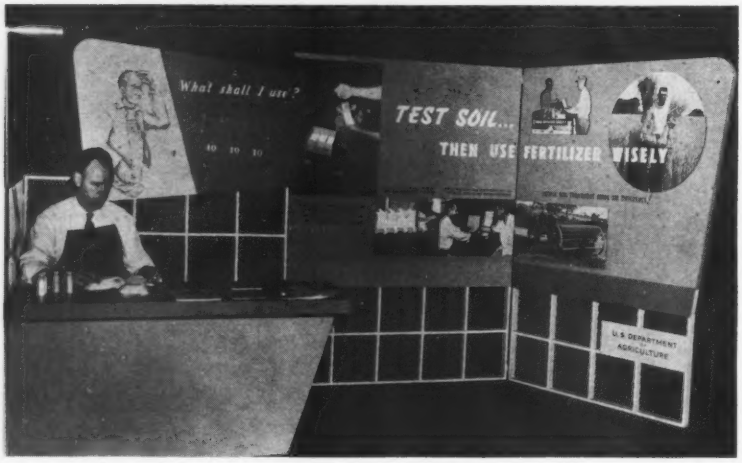
COLO. AG. CHEM. ASSN. OFFICERS

New officers of the Colorado Agricultural Chemicals Assn.: President—Irwin C. Elliott; Secretary-Treasurer—H. C. Hansen; Vice president—Frank J. Randall.

FARM CHEMICALS

Government

USDA SOIL TESTING EXHIBIT



A colorful and practical exhibit illustrating the value of soil testing in determining the proper fertilizer application on the farm has been prepared by the Exhibits Service, USDA.

In connection with the exhibit, a desk is provided for use in displaying and disseminating soil testing literature or for receiving samples of soil for testing. The over-all dimensions of the exhibit are 12 feet aisle frontage, 6 feet depth and 7 feet height. Shipping weight is 450 pounds.

The booth is available, on loan, from the Department's Exhibits Service, Washington 25, D. C., on a basis whereby borrowers are asked to absorb the cost of transportation and also provide space, handling and any necessary local drayage. Initial inquiries should indicate dates and locations of occasions for which the exhibit is intended.

The National Plant Food Institute staff cooperated with the USDA in the planning of the exhibit.

INDONESIAN RESEARCHER STUDIES FERTS. AT CLEMSON

Raden Roesdi Natakoesoema, a 38-year old Indonesian agricultural researchist, will make a ten month fertilizer study at Clemson College under the International Cooperation Administration program.

Indonesia, critically low in food requirements, has found it impracticable to raise production of rice, its chief crop, without first improving its nitrogen deficient soil. The plan is to produce about 100,000 tons of urea using natural gas from Palembang oil fields as a basic raw material.

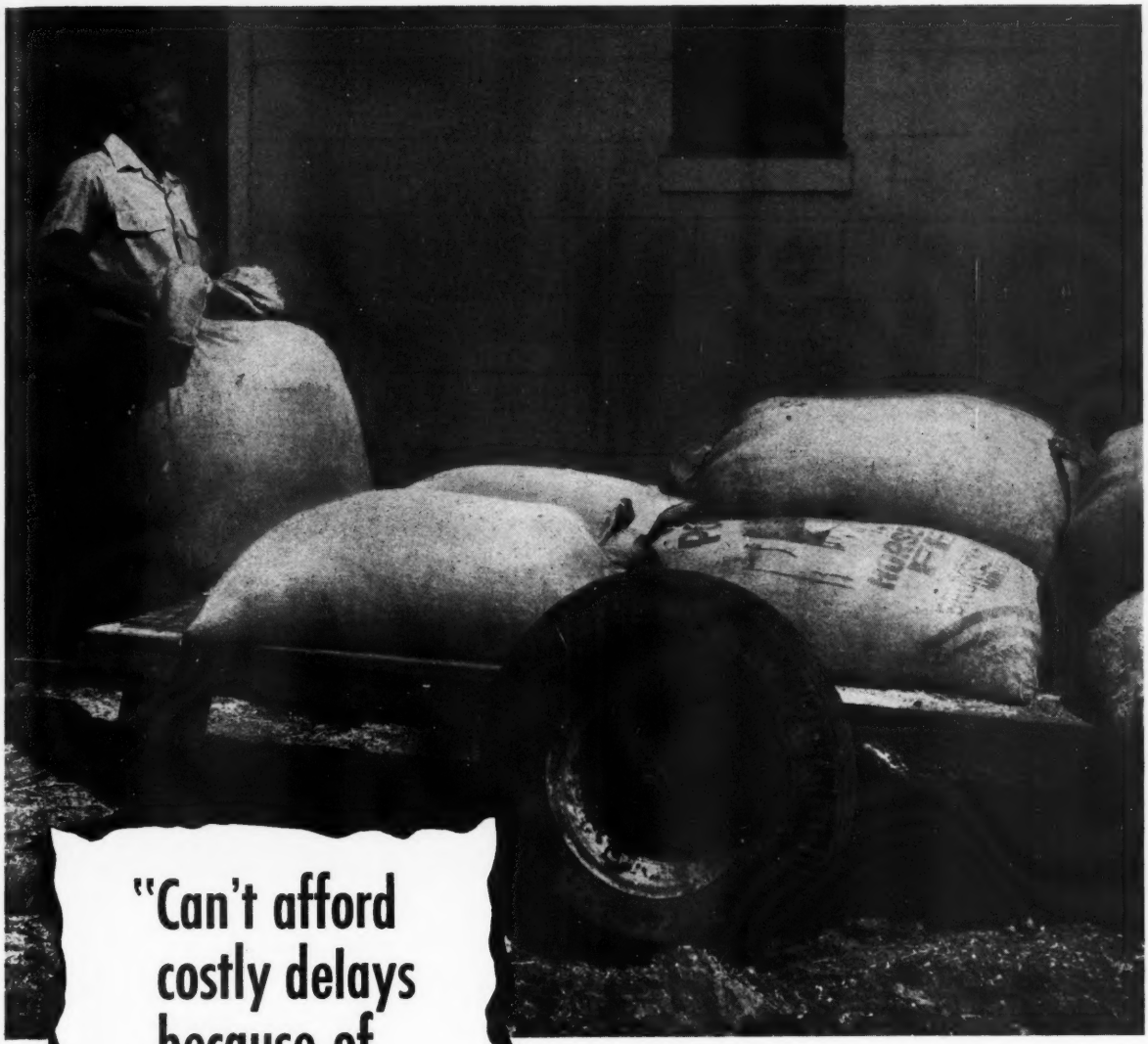
Natakoesoema's work at Clemson will cover control procedures, plant inspection, distribution of effective analysis, inspection fees, tags and stamps, tonnage reports and penalties.

A short tour of Deere & Co., Grand River Chemical Div. and Grace Chemical Co. facilities will follow the Clemson stay.

ADVISORS URGE MORE PESTICIDE APPL. RESEARCH

Expanded work to develop and improve equipment and methods for applying pesticides and herbicides was placed on the "high priority" research list recently by USDA's Farm and Home Equipment and Structures Research Advisory committee.

The group has also urged increased basic and applied research on tillage equipment for seedbed preparation, subsoil management and wind and water erosion control, increased studies on the effects of electric energy radiation on seeds, insects and plant diseases.



"Can't afford costly delays because of torn bags,"

says Harlan Jackson, Montgomery, Alabama farmer. "We buy fertilizer in burlap bags because we can handle them as roughly as we want. Then too, the re-use and resale value of the bags are big reasons for burlap. We make a nice cash saving from bag returns over the year, and we keep some empties for countless uses around the farm."

The resale value of the burlap bag gives your customer a cash discount on every ton of fertilizer he buys.

Just ask your own customers—

they'll tell you that burlap

Is strong — takes dragging, dropping, *man-handling* — any tough job on the farm.

Gives good ventilation — keeps farm supplies and products fresh.

Laughs at sudden showers — wetness or dampness can't weaken it.

Saves money — extra value from re-sale and re-use.

Saves storage space — stacks to any height without slipping.

Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

THE BURLAP COUNCIL

of the Indian Jute Mills Association

155 East 44th Street, New York 17, N. Y.

Carteret A.A.C. Co. Plant
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Another source of AA quality products

To meet your "quick" or "long term" requirements for a variety of chemicals, depend on the A.A.C. Co. You can count on uniform quality and guaranteed purity through rigid laboratory control. You'll get expert assistance from skilled research people in developing "specials" for unusual projects. And you can count on prompt service.

CHOOSE FROM THESE AA QUALITY® PRODUCTS FOR FARM AND INDUSTRY

Florida Phosphate Rock • Superphosphate • AA QUALITY Ground Phosphate Rock
All grades of Complete Fertilizers • Gelatin
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VIEWING WASHINGTON

with Farm Chemicals Washington Bureau

on agriculture

As the new crop season gets under way, don't count on farm income to boost fertilizer and chemical sales. Plan to live with the same conditions confronting you last year. Farmers have the same amount of money generally now as they had a year ago, with slight increases here and there. But their living and production expenses are higher. If the farmer thought twice about buying last year, look for him to think three times this year.

Discount the tea-pot tempest now raging in Washington over 1957 farm income. It's only a fight on how the USDA reports farm income figures. The figures Secretary Benson uses show an increase of income in 1956 over 1955. The figures used by his detractors show a decline. Both are using USDA statistics. Fact remains, no matter which is right--their difference is so slight that even the higher figure indicates no significant income rise.

Factors other than income, however, could improve the sales picture. For example, price supports have been reduced all along the line--for feed and food grains, except wheat. According to the economists, that provides incentive to produce more per acre. Cotton supports are lower and plantings are down, providing the same kind of incentive. The same for tobacco, soybeans, flaxseed, sorghums. Vegetable prices are up, stimulating greater interest in expanded production.

Farm production this year, due to the mentioned factors and others, is expected to continue at record levels--as indicated by the Agriculture Department's March Planting Intentions Report. Soil Bank apparently is acting as a damper on production primarily in drouthy areas and on farms where land was to be taken out of production anyway.

Soil Bank participation this year will not be as great as USDA had hoped--nor as Ike had predicted. The official goal for the high-paying acreage reserve was 25 million acres. Only about 20 million have been signed. The goal for the long-range conservation reserve was 20 million acres. Unless a sudden rush develops, prospects indicate little more than 10 million acres will be signed.

Money for running farm programs during the fiscal year beginning July 1 will be held up. The Appropriations Committee has recessed budget hearings for a month and a half, pending the results of a current field investigation into operation of the Soil Bank. Farm subcommittee Chairman Whitten indicates the committee may force some Soil Bank changes by virtue of its control over spending.

VIEWING WASHINGTON

on business

Don't be caught off-guard by Congress' comparative inaction so far on the business front. Plenty of action, and legislating is planned for later this spring--and for the next year. So far, the headlines have been on labor, but headlines are to be courted also by business investigators.

"Big" business is in for embarrassing moments this spring--when Senator Kefauver opens his promised public inquiry into monopoly, profiteering and unfair competition. Net effect of this probe may not be legislation aside from that now contemplated, but is likely to be a smear of all industrial "bigness." Kefauver will ride to the joust as defender of small business.

Antitrust laws are to be strengthened--it's top priority with the Democrats for this year, and the Administration is for it. Most likely step is forcing advance merger notification to the government--plus handing the Federal Trade Commission power to try to stop mergers in advance.

Count less on Eisenhower influence in Congress from now on. His relations with Congress have never been intimate, and they are growing even less so. Main reason for waning influence is that Ike is legally prohibited from running for a third term. This may actually be of little significance, since the Administration is moving to get rid of its "big business" label.

Value of chemical manufacturers' inventories currently are at the highest level in the history of the industry, according to the Commerce Department. The level now is at about $3.7 billion and is scheduled to move even higher in the year ahead. A good part of the increase is the result of higher prices for raw materials--although some advances in physical stocks will be necessary in order to service rising sales.

Physical volume of chemical goods produced also is expected officially to continue on the upswing. Among the reasons Commerce cites are output from new chemical plants, increased diversification to avoid seasonal slack, peak capacity production and increased productivity to reduce unit costs, and heavy government spending.

Government's fast tax write-off program now is coming to a swift end--for all industries except those involved directly in defense supply and atomic energy. Under the incentive of rapid tax amortization, almost $38 billion worth of new defense-related plants and expanded productive facilities have been approved. It is estimated that $20-25 billion of the cost of these facilities is deductible from income taxes in 5 years--rather than spread over 20 or more years.

Arcadian® News

Volume 2 | For Manufacturers of Mixed Fertilizers | Number 4

Benefits of Calcium Sulphate in Ammoniated Superphosphate

FERTILIZERS CONTAINING GYPSUM HAVE EXTRA VALUES

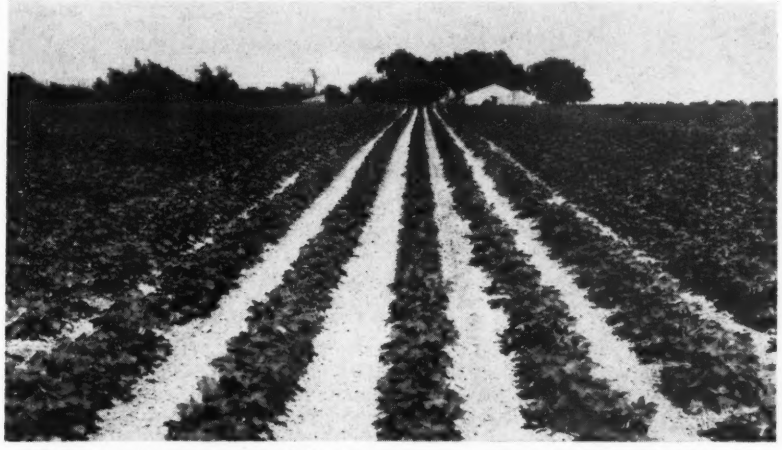
You miss a good sales point if you don't tell dealers and farmers about the extra plant foods you give away in mixed fertilizers made with superphosphate. For every unit of phosphorus in superphosphate, you give the farmer about 137 pounds of gypsum (calcium sulphate). Both the calcium and the sulphur in gypsum are valuable plant foods. In addition, gypsum is an excellent soil conditioner.

By law, a complete fertilizer contains available nitrogen, phosphorus and potash. But most crops also need large amounts of three other plant foods: sulphur, calcium and magnesium. For many crops, sulphur is as important as phosphorus. Since sulphur leaches out of the soil readily, while phosphorus does not, sulphur must be added frequently. Fertilizers containing superphosphate are an excellent source of both. The highly concentrated, mixed fertilizers made with other sources of phosphorus lack the sulphur needed by crops.

Sulphur Leaches Fast

Legumes and some other crops use more sulphur than phosphorus. Small grains contain much phosphorus, while grain straw contains much sulphur. Both timothy and alfalfa hay contain more sulphur than phosphorus. Virgin soils are no better supplied with sulphur than with phosphorus. Experiment Station lysimeter tests show that the phosphorus loss in drainage water is too small to measure, but sulphur is lost at the rate of 30 to 60 pounds per acre.

Rainwater returns some sulphur to the soil, in areas where much coal is burned. But elsewhere, many soils are fast running out of sulphur. This makes your mixed fertilizers made with superphosphate an especially good buy. For the sulphur and the calcium contained in the superphosphate, farmers pay nothing but freight and handling costs.



Cotton is a heavy user of sulphur. So are corn, legumes, onions and cabbage. Some crops need more sulphur than phosphorus. Many soils are running out of sulphur fast. Gypsum in superphosphate helps put it back.

Strong Selling Points

This makes superphosphate the best phosphorus carrier to use on sulphur-deficient soils. On non-acid soils in general, the U.S.D.A. rates phosphate sources in this order: ordinary superphosphate, double superphosphate, ammonium phosphate, liquid phosphoric acid, calcium metaphosphate, di-calcium phosphate, tri-calcium fused phosphate, colloidal and rock phosphate. Yes indeed, your mixed fertilizers made with normal superphosphate have some strong selling points!

The gypsum in superphosphate is also an excellent soil conditioner. In fact, farmers use more than 740,000 tons of gypsum a year in addition to the gypsum they get in superphosphate. In a year's time, the gypsum in superphosphate used by farmers amounts to 4½ million tons—all for the cost of shipping!

When you ammoniate superphosphate for your mixed fertilizers, you are giving farmers a bargain in free sulphur, calcium and soil conditioner. You and your dealer will benefit by telling farmers about these bonus values.

Enduring Nitrogen Expands Non-Farm Fertilizer Market

Farm use of fertilizer has hit a temporary plateau but non-farm markets are growing fast. Twenty-two million non-farm home gardeners use more fertilizer per acre than farmers and pay a higher price. Highways, golf courses, playgrounds, cemeteries and nurseries are also big users of fertilizers.

These consumers prefer one-application, labor-saving fertilizers. That's why the new mixtures containing enduring nitrogen are proving very attractive. It will pay you to take advantage of this new interest in fertilizers to increase your sales and your profits.

Get All the Facts

Start now to investigate the use of urea-form nitrogen in mixed goods. You'll discover that there are several ways to use urea-form nitrogen to make long-lasting, high-nitrogen fertilizers that can be spread in one heavy application without danger of burning.

The best method is to use N-dure* urea-formaldehyde Solution, plus some solid Urea 45, in making mixed goods by your regular ammoniation procedure. This combination gives you everything your customer wants, in well-conditioned fertilizer, at low cost to you.

More Profit for You

By using N-dure Solution and Urea 45, plus other nitrogen sources, you can make a variety of ratios of enduring and quick-acting nitrogen. Using your present equipment, you can produce analyses of the major plant foods to fit every specialty market.

By proper formulation, you get dust-free, chemically-blended, semi-granular, top-condition, complete fertilizer with long-lasting, non-burning nitrogen, at a cost that gives you more profit.

For full information on the use of N-dure Solution, contact Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.

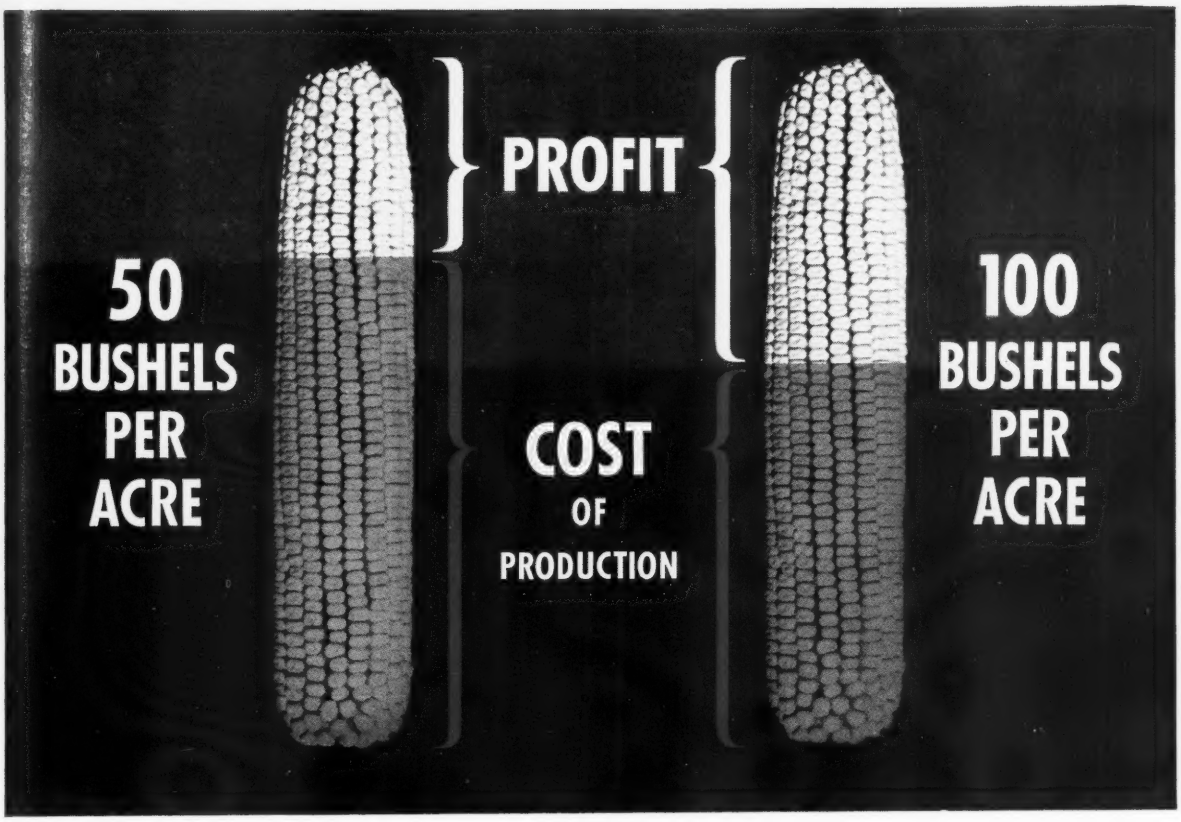
*Trade-mark

ANOTHER NITROGEN DIVISION AD to help you SELL FERTILIZER

Fertilizer Grows Farm Profits is the theme of the big, powerful advertising campaign now being conducted by Nitrogen Division, Allied Chemical & Dye Corporation, to help you and other fertilizer manufacturers sell a bigger tonnage of complete fertilizers to farmers.

The advertisement on the opposite page is the tenth in a series of full-page advertisements which have appeared in farm magazines reaching and influencing millions of farmers. This campaign is designed to tell the farmer that fertilizer is a profitable investment and the best help he can get under present conditions.

We trust you are pleased with this effort on the part of Nitrogen Division in behalf of the entire fertilizer industry. We will greatly appreciate any comments and suggestions you may wish to send to Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, New York.



How much of your corn is profit?

Part of every bushel of corn you grow is cost of production and the rest is profit. When you greatly increase your per-acre yield with fertilizer, you reduce your cost of production per bushel and increase your profit.

Fertilizer is low in cost. The extra yield added by fertilizer is the most economical and most profitable share of your crop.

The ears illustrated above show how fertilizer increased profits for typical corn growers on good land. Fixed expenses, such as land-use, management, labor and machinery were the same whether the yield was 50 bushels or 100 bushels per acre.

To increase the yield to 100 bushels, the only extra investment required was MORE FERTILIZER per acre, more seed for closer spacing and extra labor for harvesting the larger yield. Fertilizer added 50 extra bushels per acre at very low extra cost and far greater profit per bushel.

More fertilizer per acre is your best-paying investment. Results vary on different crops and soils but the basic economic fact prevails—a bushel or a pound of any crop can be produced much more economically when the yield is high than when the yield is low. More fertilizer is the direct route to high yields.

The price of fertilizer has not gone up like the price of most things you buy. It will pay you to use more fertilizer per acre! Right now is a good time to talk it over with your county agent and your fertilizer dealer!

The fertilizer industry *serves the farmer. Nitrogen Division serves the fertilizer industry as America's leading supplier of nitrogen, the growth element in mixed fertilizers. Nitrogen Division, Allied Chemical & Dye Corporation, New York 6, N. Y.*

NITROGEN DIVISION ALLIED CHEMICAL

Fertilizer GROWS Farm Profits

HEADQUARTERS for NITROGEN

When you buy from Nitrogen Division, Allied Chemical & Dye Corporation, you are served by America's leading producer of the most complete line of nitrogen products. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions for the fertilizer industry. You are assured of dependable supplies from three huge plants at Hopewell, Ironton, and Omaha. Your nitrogen is delivered to you by the best transportation facilities and equipment. You get technical assistance and formulation advice from the largest and most efficient staff of nitrogen experts. Your sales are supported by the most powerful advertising campaign ever conducted to sell fertilizers. Nitrogen Division is your headquarters for NITROGEN *plus* SERVICE. Look over the big line and contact one of the 14 offices listed below.

Arcadian® Nitrogen Solutions

	CHEMICAL COMPOSITION %					PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®								
2	41.0	22.2	65.0	—	12.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	1.147	18	26
3	41.0	26.3	55.5	—	18.2	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	1.194	7	61
6	49.0	34.0	60.0	—	6.0	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	1.134	22	1
URANA®								
10	44.4	24.5	56.0	10.0	9.5	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	1.052	29	1
U-A-S®								
A	45.4	36.8	—	32.5	30.7	0.925	57	16
B	45.3	30.6	—	43.1	26.3	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	0.618	211	—

Other ARCADIAN® Nitrogen Products: UREA 45 • A-N-L® Nitrogen Fertilizer
Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION Allied Chemical & Dye Corporation

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Columbia 1, S. C., 1203 Gervais St.	Columbia 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E.	Jackson 2-7805
Memphis 9, Tenn., 1929 B South 3rd St.	Whitehall 8-2692
Columbia, Mo., P. O. Box 188	Gibson 2-4040
Indianapolis 20, Ind., 6060 College Ave.	Clifford 5-5443
Kalamazoo, Mich., P. O. Box 869	Kalamazoo 5-8676
St. Paul 4, Minn., 45 N. Snelling Ave.	Midway 5-2864
Los Angeles 5, Cal., 2999 West 6th St.	Dunkirk 8-2301
San Francisco 4, Cal., 235 Montgomery St.	Yukon 2-6840

Chemicals

91—INTERESTED IN CHEMICAL PROCESSING?

If you haven't received your free copy of a new bulletin on agricultural chemical processing published by the Floridin Company you had better get on the ball. We'll help you get a free copy if you just

CIRCLE 91 ON SERVICE CARD

92—PYRETHRUM BOOKLET

Have you seen "Pyrethrum Facts for 1957?" If you haven't, circle the number indicated below on the Service Card for your free copy of this interesting booklet. African Pyrethrum Development reports that P.Y.R. is unsurpassed in quick knock-down, economy in concentration with synergists, rapid dispersal and high penetration. A copy of the book is yours if you

CIRCLE 92 ON SERVICE CARD

93—ONE OF THE "BIG 4"

A rich source of soluble iron for your fertilizers is Geigy's Sequestrene iron chelates. You'll find this a perfect material for formulations that call for an iron additive. For more free information about Sequestrene or any of the other members of the Geigy "Big 4," Chlorobenzilate, Methoxychlor, and Diazinon simply

CIRCLE 93 ON SERVICE CARD

94—VIRTUALLY NON-TOXIC

Those are welcome words in this Milier Bill age, and they especially apply to Pyrenone. The Pyrenone label specifies quantities that are less than the tolerances granted under the Miller Bill.

This season play it safe and use Pyrenone because it protects both the crop and the farmer's crop investment. For more complete technical data free from the Fairfield Chemical Division simply

CIRCLE 94 ON SERVICE CARD

95—GOING GRANULAR?

The Minerals & Chemicals Corporation of America are geared to supply you with nature-given process-engineered materials that will ease production and aid sales. For complete free information simply

CIRCLE 95 ON SERVICE CARD

96—SPECIAL SERVICE ON TRIPLE SUPER

Granulated triple super that sells itself on sight is available from International Minerals & Chemicals Corporation. It's bagged under your own label and shipped direct to your dealers, subject to some requirements. It's this type of service that builds customer satisfaction and repeat sales. For more free information on this service just

CIRCLE 96 ON SERVICE CARD

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

97—REDUCES INSECT FUTURES

It's a dark day for insects when Malathion sprays emulsified with Emcols H-140 and H-141 are in the neighborhood. And it will help you too, to use Emulsol Chemical Corporation products, because you reduce your formulating costs with their stable fluid emulsifiers.

For more free information on Emcols H-140 and H-141 just

CIRCLE 97 ON SERVICE CARD

98—NEW VELSICOL BOOKLET AVAILABLE

A new booklet on Heptachlor has just been published by the Velsicol Chemical Corporation. It contains the latest Federal Label Acceptances for Heptachlor.

Also included is a list of close to eighty insects killed by Heptachlor and a brief statement of recommended dosages for each.

Copies are available free by

CIRCLING 98 ON SERVICE CARD

99—THE WETTER—THE BETTER

You can get better coverage, uniform wetting and increased kill when low cost Nacconol is used as the wetting agent. Besides that it will save you money and time in your manufacturing process. More complete information is available free. Just

CIRCLE 99 ON SERVICE CARD

100—ONLY TWO EMULSIFIERS NEEDED

Formulators can prepare almost any type of emulsifiable concentrate with only two emulsifiers, Triton X-151 and Triton X-171. These two emulsifiers, produced by Rohm & Haas, benefit you in three ways: better formulations, simplified operations and lower costs. For free information on how they can help you just

CIRCLE 100 ON SERVICE CARD

How to use the READER SERVICE CARD

- **Circle number of literature you want.**
- **Print or type your name, position, company and address.**
- **Clip and mail the Service Card.**

Process Equipt.

101—SHAFT-MOUNTED SPEED REDUCERS

The American Pulley Company has just published a new catalog covering its recently introduced line of Shaft-Mounted "Screw-King" speed reducers especially designed for screw conveyor application.

This new catalog makes selection of drives for screw conveyors a simple matter. By following directions outlined and using the tables, a complete drive can be designed in a matter of minutes.

For your free copy just

CIRCLE 101 ON SERVICE CARD

102—CATALOG AVAILABLE ON METERS, REGULATORS AND VALVES

A completely revised catalog covering Rockwell meters, regulators and valves has just been published by the Rockwell Manufacturing Company.

Outstanding features of the catalog include photo-illustrated descriptions of the recently introduced Rockwell telapilot and the Hypregun, a light, compact, efficient air-operating valve lubricant gun.

This catalog may be obtained free by

CIRCLING 102 ON SERVICE CARD

103—BELT GRAVIMETRIC FEEDER

Combining accuracy with durability, the Omega (37-20) Belt Gravimetric Feeder is ideally suited to modern industry's continuous, high-capacity feeding and weighing processes.

Some advantages of the Omega feeder include a feed rate of over 3000 pounds per minute; a wide range, 100:1, variable speed transmission; rapid rate setting; and a simple, effective sensitivity control by magnet adjustment.

For more complete information on the Omega Belt Gravimetric Feeder (37-20) just

CIRCLE 103 ON SERVICE CARD

Materials Handling

104—FORK TRUCK FEATURES

Operating and maintenance features, specifications and dimensions of the new Clarklift-40 fork truck of 4,000 lbs. capacity can be found in a four-color, six page brochure from Clark Equipment Co.

Drawings illustrate such innovations as swing back hood, self-adjusting brake, adjustable upright assembly and quickly removable counterweight. There are on-the-job photos as well as charts and graphs. A copy is yours if you

CIRCLE 104 ON SERVICE CARD

105—PAYLOADER TRACTOR-SHOVELS

Literature is available from The Frank G. Hough Co. on their new-style Payloader tractor-shovels. They claim that because the Payloader digs more, carries more, and delivers more you can double production without increasing labor costs.

For more free information on Payloader tractor-shovels just

CIRCLE 105 ON SERVICE CARD

Packaging

106—KRAFTPACKER BROCHURE

A booklet has just been made available on the newest Kraftpacker Automatic Open Mouth Bag Filling Machine that accommodates weights from 25 to 200 pounds. There are a dozen or more new features and refinements, Kraft Bag reports, including heavier gauge steel construction and individually adjustable tubular legs.

For your free copy of the illustrated brochure

CIRCLE 106 ON SERVICE CARD

107—PACKAGING ECONOMY STRESSED IN NEW BOOKLET

Packaging cost reduction—from original package design to final product shipment—is the subject of a revised booklet just published by Hinde & Dauch.

The 24-page booklet includes pertinent advice on the designing, testing and storing of product packages. It also offers information on planning of the shipping department and on economy considerations in packing, sealing, warehousing and shipment of corrugated boxes. To get your free copy of this booklet just

CIRCLE 107 ON SERVICE CARD

108—AUGER-MATIC BAG PACKER CUTS PRODUCTION COSTS

Literature is available free on the new Coddington Auger-matic bag packer which offers you a simple and efficient method of filling paper valve bags at low cost.

The literature describes how you can cut manual handling of filled bags to a minimum, assure yourself of a speedy production operation and cut your packing costs to a bone and not be faced with high maintenance costs.

For more information just

CIRCLE 108 ON SERVICE CARD

Miscellaneous

109—CORROSIVE RESISTANCE GUIDE FOR ALUMINUM AVAILABLE

A new and convenient guide to engineers in determining corrosion resistance of aluminum has been published by Reynolds Metals Company.

The brochure is intended primarily as an aid to engineers designing aluminum into process plants or equipment. It should be of interest also, to those concerned with other applications of the metal.

You can get your free copy of "Corrosion Keys for Aluminum" by

CIRCLING 109 ON SERVICE CARD

How to use the READER SERVICE CARD

- **Circle number of literature you want**
- **Print or type your name, position, company and address,**
- **Clip and mail the Service Card.**

110—BLACK AND WHITE NEMATODE CHART

The Shell Chemical Corp. has just published a small black and white nematode chart. This chart is similar to the larger colored chart previously mentioned. The size is 8½ by 11, handy for a notebook. For your free copy just

CIRCLE 110 ON SERVICE CARD

111—SAFETY FIRST

Don't take chances with toxic insecticides and fumigants—investigate Willson Products Div.'s Agri-Tox Respirator. It is USDA accepted and used in handling and applying such chemicals as systox, parathion, TEPP, aldrin and chlordane. For a free bulletin

CIRCLE 111 ON SERVICE CARD

112—SAVE TWO WAYS WITH ARROW

Two-way savings are possible with Arrow Compressed Gas Transports. Arrow Equipment Co., Inc. says the transports are ideal for anhydrous ammonia, and save you money in both original and operation cost. For a free folder, specifications and prices

CIRCLE 112 ON SERVICE CARD

113—NEW PROTECTIVE MAINTENANCE BULLETIN PUBLISHED

A four-page, two-color, illustrated brochure on the application of protective coatings and linings is now available from Metalweld, Inc.

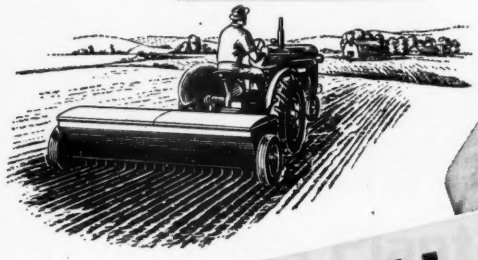
The brochure, No. 1-7, also lists coatings and linings applied by Metalweld including sprayed metal coating, synthetic resin and combination coatings. It also gives data on sand and grit blasting as well as fabrication and major repairs of process equipment. For your free copy

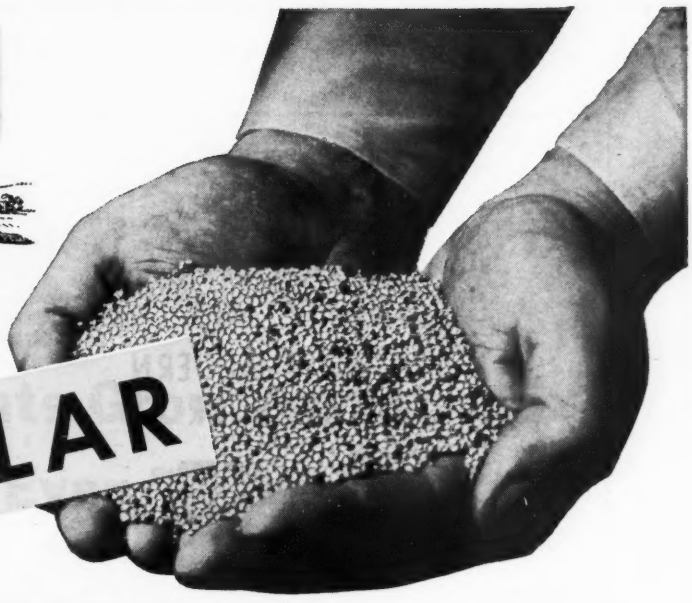
CIRCLE 113 ON SERVICE CARD

See pages 57, 58 & 62 for information on these Reader Service Numbers—

115—Bag Flattener
116—Pillow Blocks
117—Multi-Louvre Dryers
118—Joy Conveyor
119—Diaphragm Assembly
120—Velsicol Materials
121—Fertilizing Forests

TENNESSEE CORPORATION





GRANULAR

TRIPLE SUPERPHOSPHATE

For Direct Soil Application

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Makes Plants Grow Faster and Bigger Than Ever Before Possible

RESULTS SHOWN IN RESPONSIVE ORNAMENTALS, TREES, TURF, FOOD AND FEED CROP PLANTS

1. Plants grow faster, mature earlier—those requiring "long-days" for blooming, flower early.
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6. Seeds are produced earlier, in as little time as six months in such plants as carrots and head lettuce.
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You may use GIBREL in aerosols, powders, and other dry formulations. GIBREL may be present as the only active ingredient or combined with soluble nutrients. Dry GIBREL is stable, readily soluble in cold water, and noncorrosive.

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Merck supplies GIBREL in ¼ and ½ lb. containers, and as a 10 per cent pre-mix in 2½ and 5 lb. containers. For technical data, prices, or samples of GIBREL, call, wire, or write—

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RAHWAY, NEW JERSEY

Left to right: C. E. Trunkey, G. A. Barclay and Z. H. Beers, MWSIC.

Ken Keith and Harold Bingham, Spencer Chem. Co.; J. L. Sanders, Miss. Riv. Chem.

Left to right: H. G. Cunningham, Tenn. Corp.; Bill Lehman, Chilean, Nit. and Geo. Walton, Tenn. Corp.

J. D. Stewart, Federal Chem. Co.; G. H. Kingsbury, Kingsbury & Co. and J. R. Sargent, Federal Chemical Co. (left to right).

Highlights

- **CORN FERTILIZATION**
- **TILLAGE PRACTICES**
- **EQUIPMENT EDUCATION**

Middle West Soil Improvement Committee Board of Directors (standing, left to right) M. A. Smith; E. T. Potterton; Dan Williams; W. M. Newman; Z. H. Beers, executive secretary; M. A. Blue; Geo. Kingsbury; J. F. Stewart; W. W. Venable (seated) L. E. Quiram, treasurer; R. Bennett, pres.; R. Fitzgerald, vice pres.

DISCUSSIONS on proper corn fertilization and the equipment needed to do the job right about dominated the 9th annual joint meeting of Midwestern Agronomists and Fertilizer Industry representatives held in Chicago in February.

More than 700 research and extension soils specialists from 13 Midwestern Land-Grant Colleges, fertilizer industry men, farm implement manufacturers and representatives of allied industries attended the two-day meeting sponsored by the Middle West Soil Improvement Committee.

According to Zenas H. Beers, executive secretary of the MWSIC this represents the largest number of people to ever attend the meeting.

Beers also, in a talk to the group pointed out that farmers in the Corn Belt are using three times more fertilizer today than they did at the end of World War II.

MIDWESTERN AGRONOMISTS AND FERTILIZER REPRESENTATIVES MEETING

"Not only are more pounds of fertilizer going onto more acres of corn and small grains," he continued, "but each pound of fertilizer contains more nutrients.

"This trend has heightened the need for accurate placement of fertilizer in the soil where it can help most in relation to the seed."

Most of the complaints of injury of germinating seedlings of corn and small grains are due to poor fertilizer placement, because much of the equipment in use on Corn Belt farms is not designed for today's "high-speed" farming.

To remedy the situation Beers said that the fertilizer industry will cooperate with implement manufacturers and agricultural colleges in an educational program designed to provide farmers with information on what good placement equipment can mean to them.

W. H. Garman, chief agronomist for the National Plant Food Institute pointed out two factors that are holding back widespread adoption by farmers of proper placement methods: (1) Lack of proper equipment for placing fertilizer in bands at a safe distance from the seed. (2) Lack of definite recommendations for placing fertilizer by all Midwestern colleges. Garman based these statements on a recent survey among Midwestern agricultural colleges conducted by the National Joint Committee on Fertilizer Application.

In commenting on band fertilization at corn planting time, Dr. A. J. Ohlrogge, Purdue University agronomist, said that it is essential in getting the crop off to a good start in the spring.

Ohlrogge said that broadcast and plow-down applications of plant food can build up the soil's general fertility level, but it takes starter fertilizer in the band to spur the corn plant's early growth.

In Indiana tests on two different types of soil, when nitrogen and phosphate were teamed together in the same band, the corn plant utilized more than twice as much phosphate than when these nutrients were placed in separate bands.

More comments on corn fertilization came from Dr. Stanley A. Barber, of the Purdue University Agronomy Department, who cited phosphate fertilization tests with corn indicated that "we are unable to get our top yield by using only row fertilizer."

He recommended that row fertilization be reinforced by broadcast applications of plant food.

Two scientists, Walter J. Munn, agronomist with Crow's Hybrid Corn Co.; and Dr. J. F. Davis, Michigan State soils specialist, reported that farmers work their land too much before putting seed in the soil.

"Too much tillage with heavy machinery," said Munn, "packs down the soil instead of opening it up. It plugs soil pores, breaks down desirable structure, slows drainage and aeration and makes it difficult for roots to penetrate."

He reported that on their 1800 acre seed farm they apply 1,000 pounds of fertilizer per acre and return shredded corn stalks to the soil. This results in corn yields that average 100 to 125 bushels per acre.

Davis said that minimum tillage involves a "once-over" seedbed operation by pulling a rotary hoe, plow packer, easy tiller or some other smoothing implement behind the plow. He reported that farmers could save $3 to $7 per acre in labor, fuel, and machinery costs by making minimum tillage part of their crop production management program.

C. M. Woodruff, University of Missouri agronomist, reported that heavy applications of phosphate fertilizer can be profitable over a period of years on meadow crops on soil that has sufficient nitrogen and potash.

Woodruff estimated that over a 7-year period, red clover yields from the soil getting phosphate at the rate of 1280 pounds per acre, were 10 times greater than on unfertilized soil.

Hay yields were boosted as much as two and one-half tons per acre and protein production increased by 793 pounds in South Dakota tests reported Dr. Leo F. Puhr, State College agronomist.

Besides the high yields on hay, Dr. Puhr reported that fall fertilization of wheat and other small grains has given highly favorable results and is now a recommended practice in South Dakota.

Dr. William A. Albrecht, head of the soils department at the University of Missouri, said that a big market for fertilizer lies in using plant food to grow higher quality protein feed for livestock. He further commented that improvement in the feed's protein quality due to soil treatments, depends in considerable measure on the crop on which the fertilizer is used.

"There is the suggestion that while fertilizing for higher feed values will extend the market for fertilizer far beyond the area of using fertilizers for increased crop yields in bulk only, it will be also a tremendous challenge to learn how we can fertilize the soil to grow increased protein quality."

The following statement was presented at the joint Agronomists-Fertilizer Industry meeting in Chicago. The statement, prepared by agronomists from the 13 Corn Belt states was presented by M. B. Russell, head of the agronomy department at the University of Illinois. FARM CHEMICALS does not endorse or oppose the recommendation.

For 10 years or more, the desirability of expressing fertilizer grades on an elemental basis has been discussed by agronomists, both in the colleges and in industry and by fertilizer control officials. The change has been strongly endorsed by the Middle West Agronomists, the American Society of Agronomy, the Soil Science Society of America, the Association of Fertilizer Control Officials, and the Association of Experiment Station Directors.

Despite this wide endorsement and notwithstanding the fact that many fertilizer industry personnel participated in the committees and study groups that have considered the proposal in the past 10 years, there still exists a number of individuals who are not convinced that the change is in the best interests of farmers or of the industry. In the hope of achieving better understanding between the two groups, I have been asked to present the considered views of my fellow Midwest Agronomists on certain key questions which seem to need clarification.

The conversion from the oxide to the elemental basis of reporting fertilizer grades will call for an intensified educational program to acquaint farmers and fertilizer dealers with the modern simplified system and with the revised ratios and grades. We feel that this offers an unparalleled opportunity for college and industry people to join hands in a concerted educational program that will bring fertilizers and soil fertility to the attention of all farmers more forcefully than has ever been done before. This will increase fertilizer use, not only immediately but for the years ahead.

The change will greatly reduce the confusion concerning fertilizers, grades and ratios. The change is towards simplification. Therefore, the elemental basis is easier to understand. This is especially true for phosphorus. We guarantee phosphoric acid (P_2O_5) on a bag of fertilizer that contains neither phosphoric acid nor P_2O_5, (which is phosphorus pentoxide, not phosphoric acid.) Similarly, we guarantee K_2O, but this oxide does not exist in fertilizers. Actually, either the chloride or sulfate salt of potassium is the form found in most fertilizers.

The present usage is also further confused by the fact that soil test values and the mineral composition figures for crop plants are generally expressed on the elemental basis. The effect of the change will be to leave this confusion behind. Any farmer who now understands the meaning of fertilizer grades and ratios already understands the relationship of the elements. The farmer who does not understand the present grades and ratios can learn the elemental relationship much more easily than the present confusing oxide relationship.

The change results in no major problems in formulating fertilizers. The conversion of existing whole number grades to an elemental basis results in fractional grades. The adjustment of those to the nearest whole number will cause no more shifting in formulations than is commonly practiced from season to season by most fertilizer manufacturers. A study of the grades currently recommended for the Midwest shows that the change-over and rounding to whole numbers will result in an actual increase in the amount of phosphorus and potassium in the majority of those grades.

The fertilizer industry, which has shown its progressiveness in many ways in recent years, can continue its advance by joining the majority members of the vast chemical industry who are using the simplified modern elemental basis of reporting chemical composition. Such a progressive move will enhance the prestige of the fertilizer industry and will attract much favorable public and professional attention. It will give added farmer confidence to the industry and the role that it plays in our agricultural economy.

Unfortunately much of the opposition to the proposed change has arisen from questions quite apart from the change itself. As an example, the question of water-solubility of phosphorus has no attachment, either real or implied, to the abandonment of the confusing oxide method of expressing phosphorus and potassium.

It is generally accepted that the change is inevitable; it is just a question of when and how. Under the provisions of the Model Fertilizer Bill, the earliest possible date for the initiation of the change is about July 1, 1960. This would be followed by a further period of two or more years during which dual labeling would be practiced.

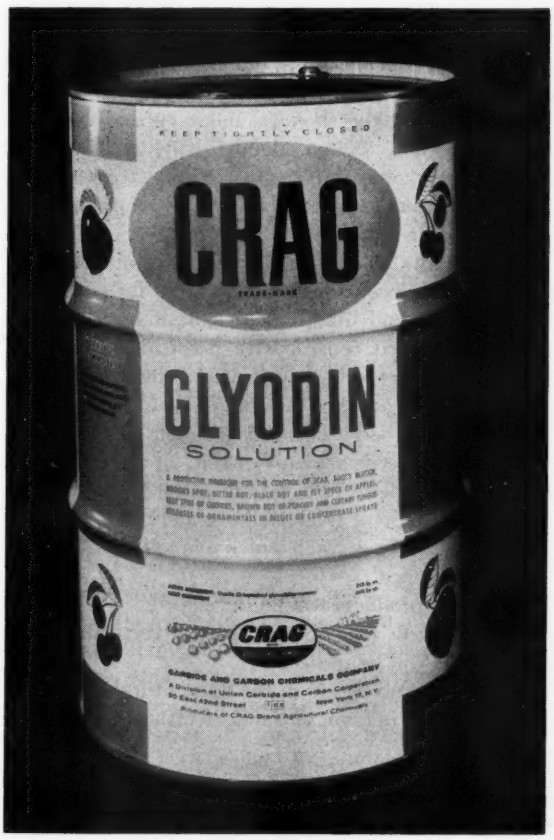
It is hoped that responsible and sincere college, industry, and control officials can immediately join hands to make the transition in an orderly and logical manner. If approached in this spirit and with a mutual appreciation of each other's problems, we are confident that this advance in fertilizer terminology will result in a better understanding by all of us, and by the farmers whom we serve, of the nature of fertilizers and the important role they play in modern farming. This will increase the use of fertilizers.

'dress up' your drums

THE CARBIDE PEOPLE DID AND FOUND OUT THAT EACH DRUM SHIPPED TURNED OUT TO BE QUITE A SALESMAN

PAPER labels on chemical drums have driven many a farmer to distraction. It's mighty important to be able to read the label to apply chemicals properly, and printed paper labels have a tendency to fade, tear, fall off, and generally thwart growers' attempts to make out application instructions.

Crag Glyodin drums, containing a fine fruit fungicide, have borne conventional paper labels in the past that were no exception. Last year, the manufacturers of Crag Glyodin, Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, decided to do something about it.



Members of the company's sales staff not only wanted to put out a label that could be read, but they knew that a more attractive drum would do a better job of selling for them. "We knew we had a quality product," states Dr. R. H. Wellman, Manager of Carbide's Crag Agricultural Chemicals Division, "and it would be smart salesmanship to do it up in a quality package."

So company management talked with several drum manufacturers and package designers. Then, they took a look at some modern new ideas in drum labeling. It was desirable, they thought, to display an attractive, permanent label lithographed right on the enamel finish of the Crag Glyodin drum.

But it soon became obvious that these labels would cost considerably more than paper labels. Some further careful planning and shopping pared this cost down. Finally, it was determined that the new labels would cost a few cents more per drum than the old paper labels.

"We decided it was certainly worth it," says Dr. Wellman. "It was imperative to give the grower a label that could be read after the drum had been subjected to warehouse handling and field exposure."

Robert G. Neubauer, Bridgeport, Conn., was commissioned to "do" the new Crag Glyodin drum, and he created a label design that had a sales-stimulating, poster-like effect.

Dr. Wellman declares: "The new drums are working for us like billboards. When they are stacked on growers' loading platforms or in the barn, you have no trouble telling that the product is Crag Glyodin; your visual impression is a pleasant one, indeed."

Carbide officials were understandably gratified last month when they learned that the Crag Glyodin drum received a high award in the third annual American Package Design Competition, sponsored by the Package Designers Council, national organization of professional package designers.

"Winning the package design award bears out the fact that we have a Crag Glyodin drum that will do a good selling job for us," concludes Dr. Wellman. "But most important, we now have a drum with a label that growers can read—clearly and consistently."

The Future of WEED CONTROL

Herbicides were near the bottom of the list in pesticide sales last year. Here is an analysis of the situation and what some of the prospects are for the future.

by W. R. Furtick
Farm Crops Department
Oregon State College

One of the newest herbicides, amino triazole, has worked wonders in destroying Phragmites.

Maleic hydrazide is applied along roadside to slow growth of grass and reduce expense of hand mowing.

DID we earn our last month's paycheck? Before answering this it might be well to look over some of the figures given by the Agricultural Research Service of the U. S. Department of Agriculture. These are contained in a recent publication entitled, "Losses in Agriculture, A Preliminary Appraisal for Review," June 1954. This appraisal indicates we sold only 1/20 of the potential market for herbicides and only 1/6 of the potential for all pesticides. This was based on the assumption that a farmer will spend one dollar for an agricultural chemical if he can get five dollars in return.

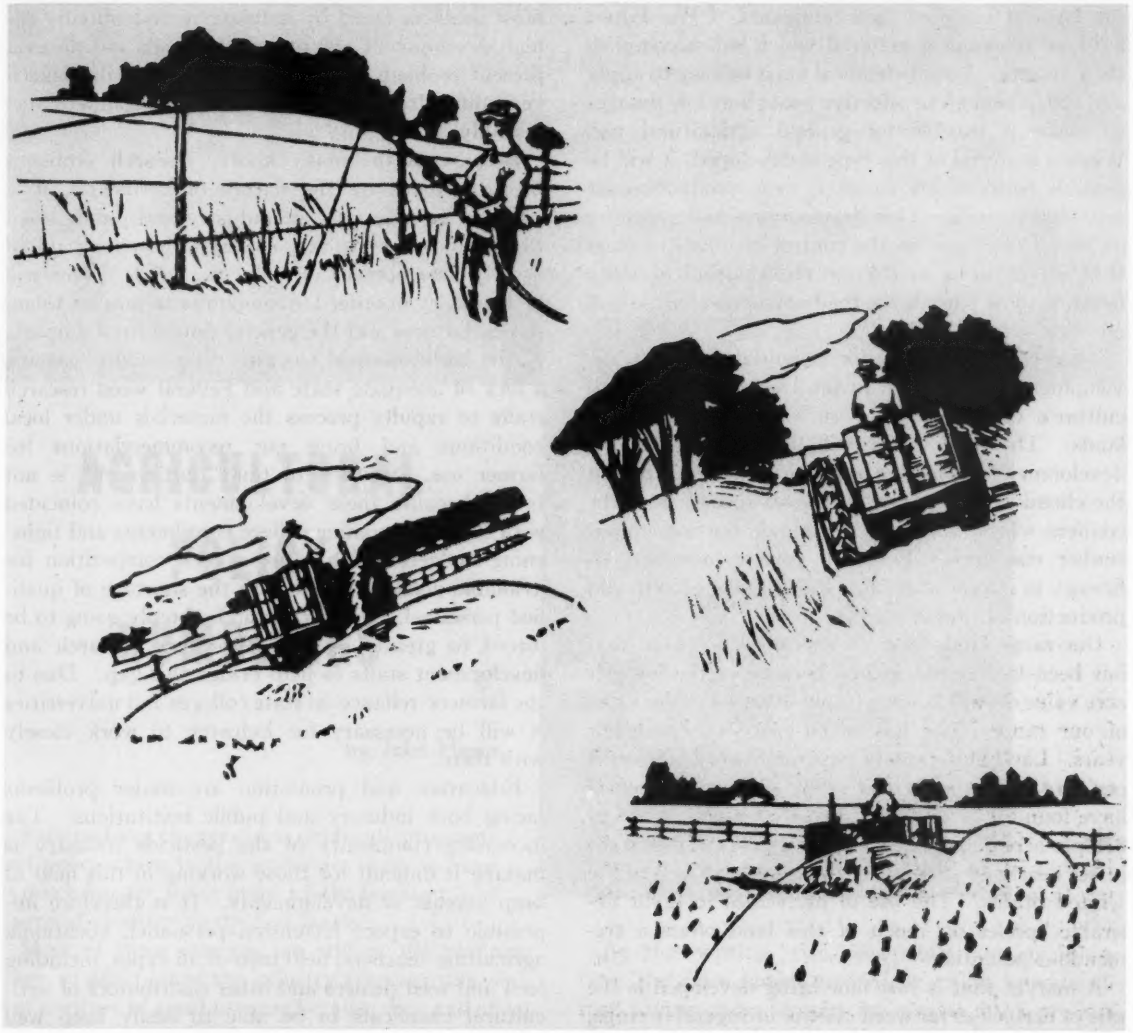
The fact that the chemical industry sold farmers nearly one-half billion dollars ($440,000,000.00) worth of pesticides this past year indicates we may have earned our paychecks, but we all know that we should be able to do better.

Because the sale of herbicides was one of the lowest among pesticides in relation to its potential market we should take a close look at how we can sell more. Weed control with herbicides offers an appealing market for the agricultural chemical industry because it is perhaps the only part of the pesticide industry where every farmer is a potential customer every year. Weeds are universal in all crop production. Let's explore how we are going to capture a larger percentage of this extensive market.

There are three ways in which more of this market will be developed.

1. Better products will be developed.
2. Improved educational and advertising programs will be utilized.
3. Changes occurring in the agricultural economy will work in favor of the Agricultural Chemicals Industry.

This paper was delivered at the Northwest Agricultural Chemicals Industry Conference in Portland, Oregon in January. The conference was sponsored by the Western Agricultural Chemicals Association.



Farms are getting larger and the labor supply shorter, necessitating shortcuts. The cost-price squeeze makes maximum efficiency mandatory.

What are we going to develop in the way of better products to make it easier to sell the American farmer? The most immediate development will probably be weed killers of narrow selectivity. Simazin offers the best current example of this type herbicide. This material has a high degree of specificity for a very small number of crops, primarily corn. It controls essentially all common weed species found in this crop at a very low dosage rate. Corn at the same time has nearly an infinite tolerance to this chemical. We will see continued developments in this direction for each of the major crops such as cotton, potatoes, soybeans, peanuts, etc.

Longer lasting soil sterilants which will economically control all types of weed species will be developed for solving weed problems on roadways, railroads, industrial sites, public utilities, etc.

New herbicides will also be developed with a general high potency and short residual life. This will make it possible to eliminate all perennial rooted plants without interrupting the productivity of the soil. The elimination of troublesome perennial rooted weeds on agricultural lands will have to be coupled with annual use of highly specific selective weed killers to eliminate seedlings for weed free crop production.

Other chemicals that may be further in the future will include materials which induce seed sprouting regardless of dormancy or depth. This will give a means of eliminating the latent weed problem always present from the enormous number of weed seeds in the tilled area of agricultural lands. Even if this development does not occur, there will be materials found which will kill all weeds, weed seeds and perhaps plant diseases or other soil borne pests while staying in the soil only for a short time. One or more materials of this type are currently on the market in

the form of so-called "soil fumigants." We do not have an economical material which will accomplish these results. Such a chemical must be easy to apply and cheap enough or effective enough at low dosages to make it feasible for general agricultural use. When a material of this type is developed, it will be possible to eliminate weeds in crop production for extended periods. This development will cause an increased emphasis on the control of weeds in areas that would be a source for reinfestation of clean fields, such as fence lines, roadways, waste-areas and non-agricultural lands.

There are new areas for potential herbicide development not included in the Department of Agriculture's estimates. One such area is our forest lands. The near future will undoubtedly see the development of selective herbicides which will permit the chemical removal of hardwood species from the conifers which make up the major portion of our timber resources. This will permit increased efficiency in reforestation and speed up the growth and production of timber stands.

Our range lands offer an enormous potential that has been largely overlooked because of the low per acre value of such lands. Rapid inflation in the value of our range lands has taken place the past few years. Land in the recent past worth only fifty cents per acre now is valued at many dollars. Ranchers have found it profitable to invest as much as $25 or $30 per acre on range and make it pay. Range comprises nearly 40 per cent of the total land area of the United States. The use of herbicides to favor desirable species on much of this land offers a tremendous potential.

A market that is just now being developed is the sale of herbicides for weed control in vegetable crops, high value specialty crops, nursery stock and lawns. These are low in acreage, but high in unit value. They can stand high priced chemicals if they solve the weed problem. This market is an easy one to capture because weed control costs by present methods are very high.

The home garden market will be captured in the near future. This is a market that has been very difficult to reach in herbicide sales because products must be foolproof before they can be sold in this trade. Insecticides and fungicides have long had a large home garden market. This has not been true to the same extent with herbicides because we are dealing with materials highly toxic to plants. A material has to be absolutely foolproof before it can be trusted with the average home gardener.

The development of new materials for the extensive type crop such as corn, cotton, various legumes, etc. has already been mentioned. The first companies to produce highly selective material for the major crops will reap big dividends.

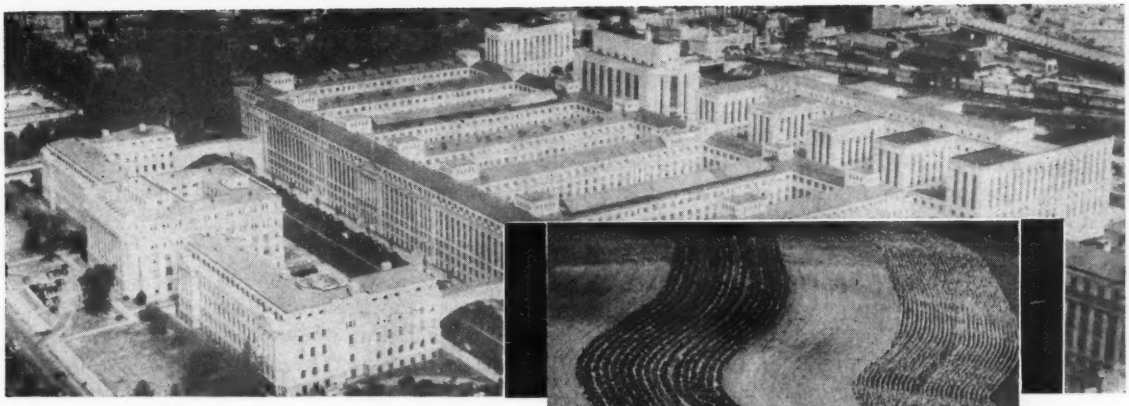
Let's look at some of the problems that will be faced by industry and public institutions. The foremost problem faced by industry is undoubtedly the high development cost of new chemicals and the ever present problem of obsolescence. This will make it very difficult for small companies to compete successfully.

Because of the many knotty research problems brought about by the nature of herbicides, it is going to be necessary for industry and public institutions to cooperate very closely to insure rapid and orderly development of new compounds. This will be necessary in order for companies to protect themselves, farmers and the general public from damage.

The herbicide field has grown up rapidly, causing a lack of adequate state and Federal weed research staffs to rapidly process the materials under local conditions and bring our recommendations for farmer use. Solution of this "bottle-neck" is not bright because these developments have coincided with the mushrooming college enrollments and tightening budgets which cause a keen competition for available dollars and increase the shortage of qualified personnel. Industry is undoubtedly going to be forced to greatly increase their own research and development staffs to help bridge this gap. Due to the farmers' reliance on state colleges and universities it will be necessary for industry to work closely with them.

Education and promotion are major problems facing both industry and public institutions. The increasing complexity of the pesticide industry is making it difficult for those working in this field to keep abreast of developments. It is therefore impossible to expect Extension personnel, vocational agriculture teachers, field men of all types, including feed and seed dealers and other distributors of agricultural chemicals to be able to easily keep well informed on current developments. A much greater emphasis is going to be necessary on new educational programs all along the line to overcome these obstacles.

The need for basic research is critical in the herbicide field. In the rapid rush of events this is being seriously neglected. Means must be found to increase the amount of basic research done by both industry and public institutions if we are going to avoid many of the pitfalls that we may encounter. It is also going to be necessary for basic research to unlock the door to many of the developments necessary before the full potential of the herbicide field can be reached. Research underway in both industrial and private institutions is literally "tearing the plant apart to find out what makes it tick." Every effort is being made to isolate the chemical components responsible for each phase of plant growth and development. Eventually such basic research will find the key to a new field that may be bigger than the present field contemplated for herbicides. This is the field of plant growth regulators in which the "sky may be the limit."



AGRICULTURAL POLICY RUMBLINGS

by John Harms

Far-reaching changes in agricultural programs and policies now in the works are likely to have as much impact, if not more, on the fertilizer and chemical industry as the Soil Bank.

Most of these changes are still in the planning stage, so won't affect the industry's market this year. But they are of great interest because they *will* affect sales in the years ahead.

One of the chief changes is expected to be a major overhaul of present federal farm programs. The thinking within Congress, the Agriculture Department, farm organizations and industrial groups interested in farm policy indicates a high-powered drive next year to "bring reason into farm programs."

The key to this general swing toward change stems from the now generally recognized fact that present acre allotment programs—the primary federal crop control device—are failing in effectively adjusting farm production to demand. In short, the controls do not control. Joining in this belief are strong supporters of the Administration's flexible price support policies.

The year 1957 is being devoted in official circles primarily to studying the various alternatives to acre allotments. This is the usual thing as far as Congress is concerned. Normally, the first session is devoted to investigation and study, while most of the real law-making awaits the second year—which, significantly enough, is the national congressional election year.

At this writing, two viewpoints are emerging. One, the more radical approach, would provide direct payments to farmers for cutting back production, or increasing production—depending upon the national need. This is the old "Brannan Plan," and is about to be revived. The other, a more conservative approach, would provide high government price supports for that part of a commodity which is sold on the domestic market. Production over and above the domestic requirements would be sold at free-market levels. This is the Domestic Allotment, or "two-price," plan.

Under either plan, it would be up to the individual farmer to decide how much production he will shoot for, and whether he wants to accept government payments and production edicts. Both of the plans, or variations, will be debated at length in the 1958 congressional session—and to some extent, at least, will be acted upon.

A more revolutionary and significant program to the industry actually is nearer adoption, since major segments of the particular commodity group involved —tobacco—are endorsing it. This program could have greater impact on the chemical industry, and sooner, than the other two. It is the so-called "bushel-pound and acre control" plan.

Pound-acre controls are strongly advocated by some tobacco interests as the solution to the surplus problem. There now are several bills before Congress to permit growers to vote in a referendum on the issue. The choice would be between continuation of present controls and a switch to acre-pound controls. Congressional hearings are expected to be held later this spring.

Advocates of this approach point out that—in addition to the tight federal rein on production—there would be less pressure to strive for ever higher yields by increasing the number and amount of production inputs. Specifically, they say this would mean less need for fertilizer. The farmer would be given both an acre allotment and a card showing how much tobacco he can harvest from an acre. One method under consideration would tell a grower how many plants he could set per acre. This type of control has been talked for flue-cured and burley tobaccos, but Agriculture Department officials indicate that the law may be written to cover all tobacco varieties.

Significant thing about pound-acre controls is that, once tried on one major crop, efforts probably would be made to establish them for other crops. While the move is on to push this approach for tobacco next year, any move toward other crops undoubtedly would wait until the program could be evaluated.

Whereas some of the farm program changes under consideration may tend to apply adversely to fertilizer and chemical use, a far-reaching suggestion involving farmer taxation by President Eisenhower may carry some blessings for the industry. In his recent statement on the drouth, the President discussed tax ideas which would affect all farmers—not just those in drouth areas. These suggestions ultimately would contribute to increasing the farmer's spending power.

For example, take Ike's income tax proposal. Under present laws, it is difficult for farmers to recoup in good years for diminished income of the poor years. For instance, a farmer has an unusually good year, with large crops, good prices and high income. His taxes would increase considerably, being in a higher tax bracket. The next year is poor and income is down. Thus, his taxes are lower—but he still lost income, spending power, to last year's higher taxes.

Under Ike's suggestion, farmers would be allowed to average their incomes over a 5-year period and pay income taxes on the basis of this average. In that way, the high years and the low years would be evened out and taxes would be paid on the basis of the longer-range earnings of the farm. There would be no penalty for highly productive years, as now. This has considerable support in Congress.

Then there is a capital-gains tax proposal. In general, this idea is to consider more farm income as capital gains for tax purposes—which would result in a lower rate. Further, Ike suggests concessions on State and local taxes for the farmer. Idea is to work out methods using taxation to encourage more uses of farm lands. For instance, taxes might be lowered on land taken out of crops and planted to grass in persistent drouth areas. Then there could be the threat of a tax boost if grassland is plowed.

These official proposals were made at a significant point in the legislative situation. There is a spreading clamor to provide some tax assistance to small business—and this would include farmers. Again, however, this year the lawmakers are investigating and studying, and the chances for some farm tax relief are high for next year—before the congressional elections.

As for the Soil Bank, there now seems to be no chance for major revision this year—and even if there were, the general feeling is that it would have no effect on production, nor on the fertilizer and chemicals market. Any action from now on would be too late to have appreciable effect.

Expert opinion in Washington has it that all of the Soil Bank forces which affect fertilizer consumption now are working and that Congress is not likely to take action which might change the picture. As to the insecticide market, the most sound expert opinion indicates that you can't predict Soil Bank impact in advance since we have no experience to draw on. The strongest influence on the chemical market still is expected to be the prevalence of insects.

Field reports indicate that the Soil Bank is having varied effects on fertilizer use in various sections of the country. Whether fertilizer use is increased or decreased appears to depend more upon crop prospects and upon the kind of crops raised than on actual Soil Bank operation. For example, surveys show that fertilizer consumption will be down this year in the Southwest and West, where there is widespread Soil Bank activity, but up in many parts of the Midwest and East, where "bank" activity also is relatively heavy.

Of interest to the industry is the fact that Soil Bank officials—from President Eisenhower on down—predict 1957 will be the big year for the Soil Bank. After this year, its effect will be successively less, they say. Boiled down, this means the experts on the program see one blessing for the industry which is often overlooked. Regardless of how much fertilizer and chemicals the program sells this year, it has "educated" many farmers quickly to fertilizer and chemical benefits. Without the Soil Bank, there's little doubt that this important "educational" process would have been slower. Thus, almost regardless of the pro's or con's of the Soil Bank, it is doing for the industry something it could not have done for itself in such a short time—according to the experts.

NAC SPRING MEETING

MEN

MONEY

CREDIT

HIGHLIGHTS

Men, Money and Credit, three important items in any business, highlighted the discussions during the annual Spring Meeting of the National Agricultural Chemicals Association held in San Francisco March 6, 7, and 8.

Over 300 delegates heard Mr. F. W. Hatch, president of the Association and manager of the Agricultural Chemicals Division of Shell Chemical, set the theme for the conference in his presidential address.

"In taking this so-called 'sharp and realistic view of the future,' it is not my intent to utilize a pair of 'rose-colored' field glasses in order to dramatize some new wonder world in agriculture which might be forthcoming from the test tubes of our research laboratories," he said.

In his address, he mentioned four factors that are exercising the greatest influence on the present position of the industry and will guide industry planning for the next two to three years. They are: (1) The effect of the Miller Bill on research, development and marketing programs. (2) The resistance certain insects of economic importance have developed to some of the more important compounds. (3) The economic position of the industry. (4) The urgent need to improve selling effort.

In commenting on these points, Hatch said,

"We should *not permit* current problems arising in making the Miller Bill operative, diminish our confidence in this legislation. If you might be inclined to waver, speculate for a moment on what our position might be today had the Delaney Bill been enacted. The Miller Bill had our support when it was before the Congress, and I trust it will be so administered as to continue to merit the support of our industry.

"The resistance problem now being so widely publicized, is *not new*. It does dramatically emphasize, however, the fact that our industry is indeed complex. It also strongly supports the need for expansion of both *fundamental* and *product research*.

"Solution of economic problems must come primarily from a *better selling effort*—which can only be developed through better training of our sales organizations right down to the dealer level. The type of training that will equip our sales personnel to demonstrate to the farmer, the higher return he can expect from increased yields and improved product grades for each pesticide dollar he invests."

F. C. Shanaman, president of Pennsylvania Salt Manufacturing Company of Washington, had as his topic, "Return on Capital Necessarily Employed in the Agricultural Chemicals Industry."

"Bigness in agricultural chemicals, in one form or another, is sometimes desirable, but is not necessarily a panacea for what may be wrong nor will it necessarily accomplish what may be desired," said Shanaman.

When the industry is experiencing an economic down-swing, the climate is inclined to turn from "cool to frigid" with respect to new capital, he observed. In diversified organizations, each dollar requested for agricultural chemicals is critically judged for its ability to earn in comparison with other company activities. Outside capital doesn't show any great willingness to invest and borrowed money is difficult to come by. Cost reduction alone won't give improvement desired and reduction in capital employed may come hard because of competition.

Shanaman said that the lack of statistical data in our industry makes it difficult to prepare a factual talk, but with assistance, he has come up with this information:

"In the case of national formulators our guess is that better than 50 per cent of them are earning less than 4 per cent on sales before tax. Out-of-pocket costs are probably 70–90 cents on every sales dollar, leaving little to cover fixed costs and provide a profit. Total capital required is high, amounting on the average between 70 and 75 cents for each sales dollar. The major investment is not in plant and equipment but in current assets namely inventories and accounts receivable," the Pennsalt president reported.

"In the case of accounts receivable our record is abnormally high when compared to the average of all industries," he continued.

"If the foregoing observations are a reasonable economic base from which to take off, it would seem to indicate little room for price concession."

In conclusion, Shanaman said that the main thing he wished to emphasize was "the homespun fact that what applies to a peanut stand, or to a colossus such as General Motors, with respect to earning a reasonable return on dollars used, can be expected to apply to a company engaged in agricultural chemicals. A simple approach is to consider net profit, turnover, and return on capital necessarily employed."

"Agricultural chemicals is a fascinating, exciting business. We have been immature but there is no compelling reason why we must continue. Maturity will require us to chart our course more accurately and with somewhat less emotion. We can understand our problems better and plan decisively with the best of them. A willingness so to do is urgently needed. A commitment to do better in the area of return on the dollars is essential. It is certain that we can do it—that we will want to do it—and in time we will have to do it or many of us will not survive."

Another interesting talk was given by Robert L. Furniss, USDA, on Forest Pest Control. We'll have more on that in a later issue. On the following pages are excerpts from the speeches of three of the speakers on the main topics of Men, Money and Credit.

MEN

DR. S. B. FREEBORN
Provost
University of
California, Davis

. . . no institution ever produced the educated man. The best of them from some of their students produced individuals who had the ability and urge to educate themselves to varying levels of competency and culture after they forsook the cloistered walls.

A college education is a very effective springboard to industry, but except in those cases where certain degrees have been set up as requirements for qualification or as screening devices, the sole function of higher education is to lay the foundation, in a concentrated period, for a student to attain a goal that he has outlined for his life. . . .

Eighty per cent of the youth of this country are presently graduating from high school, 30 per cent are taking further post-high school training and about 15 per cent are graduating from college. Based on industry's present statistics, a large proportion of tomorrow's leaders will come from this latter group.

How do you in industry want them steered during their under-graduate years? A short look at the history of college education lays the background for our present dilemma.

Up to the 1860's, higher education in this country was limited to those who sought to prepare themselves for the law, the ministry or teaching. Eliot of Harvard broke through the classical barrier and introduced there the new sciences that were flourishing in Germany along with a modified elective system that opened wide vistas of interest to inquiring young minds. . . .

Another important landmark in American higher education came in 1862 when Abraham Lincoln signed the Morrill Act which created the Land Grant Colleges for the training of the industrial classes with state and federal support and with emphasis on agriculture and engineering, but without excluding the classical studies. . . .

Colleges have tried conscientiously to keep up with the overwhelming accumulation of scientific knowledge through the proliferation of courses and subject matter content to the extent that broad courses of general education have been

MONEY

EARL COKE
Vice President
Bank of America
San Francisco

. . . The progress which agriculture has made in this country is perhaps best described as a "technological revolution," for farm output has surpassed the wildest dreams of the past. Total farm output in 1955, for instance, was 60 per cent above output in 1920. And this was accomplished with 20 million fewer harvested acres and 11.4 billion fewer man hours of farm labor. . . . The number of persons supported by the production of one farm worker was about 4.3 one hundred years ago and was 8.3 in 1920. Today one farm worker supports in excess of 20 persons off the farm. . . .

The biggest factor contributing to this change, of course, has been the mechanization of our farms—the industrial revolution of American agriculture. . . .

Another very important factor accounting for the enviable record of progress agriculture has made is the use of fertilizers and chemical sprays. . . .

Needless to say, then, the capital requirements of agriculture have increased rapidly in recent years. . . . Today the capital investment per worker is higher for agriculture than for any other important segment of our economy and the farmer's need for money to meet operating expenses is higher than it has ever been before.

In spite of the increased demand for money throughout the economy, credit requirements for normal business and even some expansion in most segments of our economy are being met; especially is this true for agriculture. Here I am defining agriculture to include not only the farmers producing agricultural commodities but those in allied industries supplying the production goods such as chemicals and machinery, and the processors, distributors and handlers of agricultural commodities.

The basic question that needs to be answered, I assume, is whether agricultural credit, by its shortage or overabundance, or by the forms in which it is available, has contributed to the relatively unfavorable position in which the producer of agricultural products finds himself today.

Admittedly, any attempt to answer this question must rely heavily on value judgments as to what constitutes agri-

CREDIT

J. A. WALKER
Standard Oil Co.
San Francisco

. . . If credit is to be used profitably, the sales objective of credit must be balanced against the financial objective of the company. With that view, the credit objective could be expressed as: to gain the greatest sales advantage with a minimum capital outlay and reasonable costs. . . .

I should like to discuss how credit can be used to the greatest sales and financial advantage in your industry—how it can help you increase sales and profits. In doing so, I shall explore with you what I consider to be five essentials of sound credit administration. . . .

The first of these essentials is a sound and workable credit policy. . . . An effective credit policy is a well-conceived plan—a plan that will guide those responsible for credit administration around the pitfalls so common in a credit business.

Management has little assurance that credit will be *used wisely* as a marketing instrument unless there is a clear policy definition of the role of credit in the company. . . .

A tough marketing situation can never be permanently overcome through longer terms, loose credit analysis, or lax collection effort. Such thinking can only lead—as it has in so many instances—to credit abuses that threaten the soundness of a firm's financial program—abuses that could result in the breakdown of the term structure in any industry. Further, it creates a situation in which those who administer credit and who normally depend upon a well-conceived plan, become the easy victims of expediency.

As a result, no one gains and everyone is faced with higher costs and reduced profits. Any marketing program that,

MEN continued

crowded out of the curriculum to the point that the usefulness of our graduates is reduced to specific technical specialties that definitely limit the graduates' general usefulness in their organizations. . . .

The great impetus in the increase of scientific knowledge with its consequent fragmentation of the old fields into relatively narrow specialties had a profound effect on our teaching programs, particularly in the professional fields. . . .

Literature, history, government, and philosophy, which had always been a part of college training, were crowded out to make way for courses designed to increase professional competence. The undergraduate years became more and more a preparation for graduate study in a relatively specialized field.

Industry reacted almost concurrently with this trend. As far as the bachelor's degree level was concerned, they continued to hire the narrowly trained graduates in increasing numbers, but it was noted that the great majority ended up at control benches although there were always the exceptions provided by the slogan that "you can't keep a good man down." Those hired at the bachelor's level from the small colleges and the liberal arts tradition demonstrated in the main that somewhere along the line they had acquired a breadth of vision, a knowledge of the world about them and a culture that admitted them to broader circles that destined them for advancement in management, whether it was in sales, production or research. The professional and technical schools realize this problem acutely and more thought is being devoted to "liberalizing" professional training than any other subject in education.

To this point I have been talking about our B. S. product, the four-year graduate. I think we all agree in the face of all I have said about the growing body of information that a well-trained scientist should have, that our specialists —our research and development men— must have the extra training equivalent to the doctorate to keep up their share of the burden.

My sole plea is that this specialization should not be pushed down into the undergraduate years at the expense of a program that has breadth in literature, philosophy, history, government *and* science.

Today the educational world is convinced that we need to "generalize" or "liberalize" the curricula of our professional students. The problem is to reach a consensus on what general education really is. . . .

The whole problem of the ideal program in general education really boils down to the capabilities of the instructors involved rather than the subject matter of the course, provided of course that we have a real breadth in the subjects taught. The instructors who can introduce the right facts and create the urge on the part of the student to think accurately, to synthesize ideas and search

MONEY continued

culture's main problem, as well as on quantitative judgment as to the extent these problems are influenced by credit. In my opinion, agriculture's unfavorable position is caused, principally, because it has too many resources—particularly human resources—engaged in producing too much of the wrong kind of commodities. . . .

From a review of studies made by the United States Department of Agriculture and by the land-grant colleges, as well as from the President's Materials Policy Commission study, one can only conclude that the long-range needs for agricultural products (as seen at the time of these studies) could easily be met by foreseeable expansions in our agricultural plant. In fact, most analysts conclude that surplus agricultural capacity will be with us for some time.

Conceivably this situation could change rather quickly if we continue attempting to underwrite our expanding role in world leadership. Some excess capacity in our agricultural plant may be a very desirable and economical form of insurance when faced with high uncertainty about our needs. However, there is little evidence supporting any claim that limited credit is preventing a desirable expansion in our agricultural plant.

Another indication of the adequacy of farm mortgage credit is the trend in agricultural land prices which have increased about 64 per cent as an average for the United States over the past 10 years. . . .

Part of this pressure on increased land values comes from existing farmers who feel compelled to expand their operations in order to obtain increased efficiency made possible by technological advancements. Furthermore, there is the pressure from "suburbia" as some farmers "seed their land to subdivisions." Not only do these farmers receive fancy prices for this land but they, in turn, move further out on the periphery to reinvest these funds. The fact that their capital gains tax is waived if they reinvest in agriculture within a specified time period induces additional pressures on land values. Then, too, there has been a rather heavy flow of capital from successful lawyers, doctors and businessmen into agriculture in the last 10 years. . . .

With such high land prices relative to capitalized returns, institutional lending agencies can finance only a portion, if any, of a sale. However, the fact that farm real estate mortgages are held by others in such volume seems to indicate no shortage of credit in this field. Certainly our need is not for more people to enter agriculture, but for more people to leave agriculture. One advantage of the current high land prices is the encouragement it offers those farmers on uneconomical-sized units, or those whose management practices are below standard, to get out of agriculture into some occupation offering them greater opportunity.

I find no indications that the form or terms in which long-term capital flows into agriculture exerts an adverse effect on the kind of commodities produced. That is, the flow of long-term capital does not seem to direct production away from those commodities most desired

CREDIT continued

instead of merchandising products and services, depends upon the selling of credit concessions—or the unsound mortgaging of the future for the temporary present—is on boggy ground. . . .

A credit policy sets the course for credit management. It should give consistency and direction in the use of credit. Yet, a policy—no matter how sound it is—will not fulfill that purpose unless it is fully accepted and understood by the sales and credit personnel who administer it. It is important, therefore, that such a policy carry with it the authority and viewpoint of top management. A policy that stems from top management and is expressed in writing to all concerned will eliminate much of the needless friction and dissension that too often center around credit.

The second essential of sound credit administration is factual credit analysis. . . .

Factual credit analysis depends upon two things: access to reliable sources of information and skill in appraising the paying ability of customers. . . .

Let us consider the third essential—to collect receivables in such a way that your company is assured of a continuous and adequate flow of funds from this source.

Every business builds from the capital invested by its owners or stockholders. That capital must be distributed effectively over all parts of the business. Plant, equipment, inventory and receivables all require a share of those funds. It is a severe test of management skill to use that capital profitably.

There is perhaps no better use of operating capital than to carry sound receivables . . . accounts receivable require constant management alertness and a regular appraisal of condition. . . .

When receivables are sluggish—turning slowly, it means that the dollars used for credit are partly idle. Idle dollars, no less than idle men and equipment, are a reflection on management, for no business can afford to waste its operating capital.

What is the cost of those idle dollars? Too often their value is measured only in terms of the prevailing interest rates. A more realistic appraisal would be based upon what a company can do with those dollars—their earning power when invested in such things as new equipment, new plant, or new products.

There is also another cost that is frequently overlooked. I am referring to what is almost an axiom in the field of credit: as receivables age, their col-

for answers are the cornerstones of a liberal education.

If our professors of introductory courses in literature, government, history, mathematics and science could inculcate these principles in the first years of college experience instead of attempting to prepare their students for professional specialization, our problems would be solved. . . .

The great majority of our students come to us with an innate, overpowering fear of mathematics and any allied subject that depends even indirectly on an understanding of the symbolism of numbers. . . .

With this lack of foundation, hundreds of otherwise rather brilliant students side-step the sciences wherever it is possible to do so. . . .

A recent survey reported by General Hull indicates that 57 per cent of the senior bracket of the chemical industry have technical or scientific degrees. It would be interesting to know a little more about this group. How many received their technical degrees on top of a liberal arts degree? And how many received these from small colleges that still upheld a broad requirement in the liberal arts?

A study published in 1952 on the "Origins of American Scientists" listed the 50 institutions of the United States that lead the nation in the production *per thousand graduates* of working scientists. Only five institutions that made the list graduated more than 200 bachelors per year and only two, Johns Hopkins and the University of Wisconsin, could be called large universities, and the relatively small liberal arts colleges were in the ascendency. Considering all the schools studied, the conclusions on size were that the highest productivity of scientists is found in those institutions which are small enough to preserve their community atmosphere yet large enough to assure the adequacy of their faculty and facilities. . . .

My plea, therefore, is for a minimum of professionals, technical courses at the undergraduate level—an introduction to the fields, their language, and the allure that these subjects are certain to have for some students. I would plead for breadth in all the sciences with broad coverage in the natural and biological fields and mathematics. The rest of the time, in fact the majority of the time, I would leave to an equally broad coverage of the arts, philosophy, history, literature and government in order that the student might be better equipped to live with himself and his fellow men.

For research, development and teaching we need graduate training. My liberally trained undergraduate will probably be a little handicapped time-wise in competition with his fellow student who crammed a lot of his graduate preparation into his undergraduate years. My man may get his doctorate a year later, but I'll bet if they stay together for ten years, he will be the boss. . . .

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by consumers. In this respect, it is neutral. . . .

There has been much discussion in recent times of the need for intermediate credit for agriculture. One state farm organization passed a resolution at its recent annual meeting stating that there may be a need for "loans for two to seven years bridging the gap between short and long term credit . . . for the purchase of machinery and equipment, improvement and construction of farm buildings, and establishment of some types of livestock operations." This would indicate there is need for a type of credit not now available, although I find it difficult to determine just where the vacuum exists. The Federal Reserve System in its recent analysis of agricultural lending by insured banks showed that in the United States 33.4 per cent, or $1,285 million, of all agricultural loans outstanding as of June 30, 1956 was in this intermediate-term field. These included loans for acquiring machinery, livestock, autos and other consumer goods, and for improvement of land and buildings. Twenty-seven per cent of the money loaned by all insured commercial banks in the United States for these purposes had a maturity of two years or more, and ranged all the way to 10 years duration. It would appear therefore that although there may be some types of intermediate loans not now available there are substantial sums available to service loans of this kind.

Let us now return a little closer home and discuss the commercial bank's place in making money available to farmers . . . commercial banks held 71 per cent of our farm non-real estate loans outstanding as of June 30, 1956. How they make this money available is important to the farmers and to you in the agricultural chemical field. Three general methods are used:

1. The discounting of paper held by those selling production supplies to farmers.
2. Unsecured lines of credit for seasonal operations and expenses.
3. Loans backed by crop and chattel mortgages.

While loans in the last two categories, i.e., unsecured lines of credit and those secured by chattel mortgages may be made for a few specified purposes, in general and by far the largest volume are set up to finance all the out-of-pocket costs of production. When I say all, I mean all. Experience has amply demonstrated the folly of undertaking a financing obligation which does not include provision for all items and operations necessary for efficient production, such as spray materials and fertilizers. . . .

. . . *before* entering into a financial relationship with a farmer, the anticipated cash outlay for expenses as well as anticipated returns from sales should be carefully projected through the season. In our bank, we do this by means of an operating budget worked out together by the farmer and a lending officer or agricultural field man. Each production expense is itemized and all potential income calculated.

If, as a result of this analysis, a probable pay-out with a reasonable cushion is not indicated, the banker had better withdraw unless there is another source of income. It is a service to no one to plunge a person into debt when little opportunity for a profitable outcome exists for the venture.

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lectibility decreases and manpower and collection costs—to say nothing of losses—increase. The cost of a credit organization is usually in direct proportion to the condition of receivables. . . .

It is vital in credit administration to draw a distinct line of demarcation between the fields of credit and finance. Perhaps the most insidious pitfall for credit management is to let itself get sucked into the field of financing. Once that line is crossed, and credit is extended to the point of financing customers, it is very difficult to turn back. . . .

Through such a practice the supplier has the assurance of neither gain nor protection.

In extending credit there is also a supplier's responsibility to the customer. Many customers are not skilled financial managers. There are many cases where an extra amount of supplier's money is injected into the customer's business because no one asked for payment when it was due. When additional funds are provided the customer through excessive credit, he may be led into unsound credit practices in his own operations. . . .

In brief, excessive credit can be detrimental to customers. It can expose them to risks they would normally never take and create financial management responsibilities for which they are unprepared. . . .

By keeping the accounts of customers current, suppliers can spend more time in productive sales effort—developing new customers and new business. . . .

That brings us to the fourth essential—healthy customer relations.

By its very nature, credit is a convenience to customers and serves as an almost indispensable vehicle of sales. Yet, its value can go considerably beyond that. Credit skillfully administered is a rich source of customer good will, friendship, and loyalty. . . .

When we deal in credit, we deal with a subject that is extremely important to a customer. In fact, few things are more personal to him—or more prized by him—than his credit. He is inclined to feel that any reflection on his credit is a reflection on his integrity: . . .

As you have undoubtedly discovered, there is often more won or lost in the way a credit decision is handled with a customer than in the credit decision itself. What we say or write is no less important than how we say or write it. . . .

There is another area for improved customer relations. That is sharing with customers the knowledge and ex-

(Continued on next page)

EXPANSION PROGRAMS BEING PUSHED IN MEXICO

The Diamond Alkali Company (through its Mexican subsidiary, Diamond Black Leaf de Mexico, S. A.) is planning further expansion in Mexico.

Recently, J. A. Hughes, treasurer of the U. S. parent firm; D. S. Carmichael, secretary; W. A. Crichley, C. A. Butler and Samuel S. Savage, head of the export division, visited Mexico to study possibilities of the market here.

The firm, in collaboration with Mexican capital, has established three plants in the republic: Insecticidas Diamond del Pacifico, S. A., in Ciudad Obregon, Sonora; Insecticidas y Fertilizantes Diamond del Norte, S. A. in Matamoros and Tamaulipas and Diablamex in Xalostoc, Mexico.

The Diamond program is part of the overall pattern of the administration to increase insecticide and fertilizer production so that Mexico can be self-sufficient. Indications are that the 25 to 30 per cent production of actual fertilizer needs will go up sharply.

Evidence of the potential market is the reluctantly made admission (by the Department of Agriculture) that *only five per cent* of Mexico's tillable soil has been benefitted through *systematic* use of fertilizers. Irregular use has been made up to around perhaps a third of national agricultural acreage, an Agriculture spokesman said. But the chief drawback still is to get smaller farmers to use fertilizers consistently (the other bugaboo being reluctance of Mexican farmers to switch to the rotation-of-crops system although unilateral plantings are exhausting the earth at an alarming rate).

The administration seems to be tackling the problem from the production end first: the goal is to have more than enough production to meet national needs. Then there will be a drive, or even possibly federal legislation, to force farmers to use fertilizers.

While federal officials and large-scale agricultural interests hail the latest moves to step up fertilizer and insecticide production in Mexico, they point out that transportation problems must also be overcome. The government is working on this by speeding up its ambitious program of country roads designed to link all major agricultural regions with through main highways.

CREDIT continued

perience of credit management. Some customers need advice and guidance, and they will appreciate the credit and financial counsel a qualified credit manager can provide. It offers a fine opportunity not only to cultivate lasting friendship and confidence but to render an extra worthwhile service.

Let us consider now the fifth essential —and perhaps in some ways the most important of all. I call it management climate, an atmosphere created by company officers which will permit and encourage effective credit administration. Such a climate taps the potentialities of both credit itself and those who administer it.

What kind of a climate do you establish? You men actually establish the climate for credit in your own companies. Your emphasis or lack of emphasis upon sound credit practices has far-reaching effects. . . . Through lack of emphasis a credit organization can become passive and unenthusiastic, and the active leadership so desirable in credit administration can be lost.

As leaders in your companies, it is important for you to create and maintain a climate for sound credit. To create that climate sometimes requires some special effort. . . .

Let your sales and credit personnel know that you are interested in sound credits and collections and that you expect skills from them. It takes skill to sell your credit terms. No sales ability is required to say "yes" to a customer's request for long terms. If you are to have sound credit administration, it is necessary to arouse in your sales organization an enthusiasm and ability to sell credit terms equal to those needed to sell the quality of your products and services.

Remember, too, that credit and collection skills are especially necessary today. How those skills are developed and used will pay off in results all along the line. And what are those results? Such skills will (1) help secure and retain customers, (2) prevent your being exploited by customers who would rather use your money than borrow from a bank, (3) keep operating capital requirements for receivables at a minimum, (4) keep credit manpower and collection costs at the lowest level consistent with results, and (5) keep your losses within reasonable proportions. . . .

I hope from the discussion of these five credit essentials that I have planted this thought: the best contribution credit can make to sales and profits is an all-around, effective job of credit administration—one that is based on a clear understanding of credit objectives, one that is guided by a sound credit policy, one that reflects capable analysis, skill in the use of operating capital, and finesse in customer relations. It is a credit administration that flourishes under a management climate that encourages the fullest development of credit and collection skills. . . .

Let me assure you that credit administration is not an island in itself. Economic conditions affect credit constantly, and an awareness of those conditions is necessary if we are to administer credit wisely.

What are the conditions today that are having a particular impact upon credit administration?

We could probably all agree that competition is tougher. . . .

Aside from this increased competition, there is the tight money or tight credit situation which has been so much in the headlines and which is making itself felt in almost every business. . . .

It has meant, of course, higher interest rates to your customers who need to borrow. This, however, is usually taken in stride. More important, when credit is tight, lending institutions become more selective. Many businesses and farmers —particularly those that are new or marginal—find it increasingly difficult to borrow at all, and some are able to borrow only part of what they need. . . .

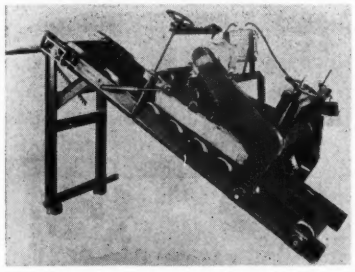
Plans for expansion were made by many firms during an easier credit situation. Some of these companies are already partly committed, and their plans cannot be easily changed. When expected financing cannot be arranged, these customers are caught in a financial squeeze.

The tight credit situation has been accompanied by—and to some extent aggravated by—other factors. Among them are the accelerated income tax payments required of corporations and the squeeze of costs and prices that farmers have been experiencing. These conditions, self-evidently, have increased the financial pressures on these groups. . .

. . . Let me emphasize that sound credit is an integral part of good business management. The extent to which credit will contribute to the sales and profits of your industry will depend, in a great measure, on the attitudes and actions of you men here. Your leadership, your awareness of the essentials of sound credit administration, and your recognition of the opportunities and possibilities of credit will assure that credit administration will share in the progress of the agricultural chemicals industry.

DESCRIBE FLEXOVEYOR BAG FLATTENER FEATURES

Flexoveyor Manufacturing Co.'s heavy-duty bag flattener uses power-driven condersite cov-



ered rolls and rough top belting, the firm reports.

The standard unit is 24″ wide x 6′8″ centers and powered by a 1½ hp gearmotor. Flexoveyor reports that the unit can be furnished horizontally for floor mounting, or with casters for portability or can be inclined up to 35°.

The discharge end can be fitted with an adjustable steel apron or a bar type glue chute with glue pan, and glue applicator wheels can be provided to allow bags to be blue stripped for palletizing. A thermostat controlled electric heating element can be mounted in glue pot to keep glue at desired temperature.

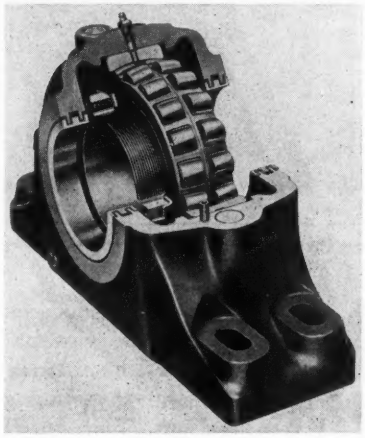
For more details,
CIRCLE 115 ON SERVICE CARD

NEW DODGE SPHERICAL PILLOW BLOCK LINE

A new line of spherical roller bearing pillow blocks is being manufactured by Dodge Manufacturing Corp.

Named Spher-Align, the pillow blocks have a new mounting feature, called Micro-Mount, which makes it possible to seat bearings solidly on shafts quickly and easily. This is accomplished, says Dodge, through the use of set screws located parallel to the bore in the adapter nut. After the bearing is snugged up with the adapter nut, adjustment is completed by turning the Micro-Mount screws against the locking washer until bearing, adapter and shaft form an integral unit.

A new feature of bearing design allows lubricant to enter at the center of the bearing and move outwardly along all bearing surfaces. Dimensions of the pillow



blocks are standardized, making them interchangeable with all other similar units.

For further information,
CIRCLE 116 ON SERVICE CARD

NEW RESPIRATOR-MASK DEVELOPED BY USDA

The Agriculture Department now has come up with a respirator-mask which keeps out not only insecticides but fungicides and nematocides as well.

The respirator consists of two units on a small facepiece fitted to the nose. Each unit contains an activated-charcoal cartridge covered with glass, wool or wood-fiber filters. (The glass fibers are less than one micron in diameter and the finished filter is almost weightless). The combination of filter and activated charcoal cartridge keeps out toxic sprays and dusts as well as odors—yet permits normal breathing, according to USDA chemist R. A. Fulton and pathologist W. D. McLellan, the developers.

The new type filters which stop all insecticides were developed two years ago. At that time, the equipment was tested against fungicides and nematocides and approved for all three uses in the last few months. The unit has been approved by the Civil Aeronautics Authority for pilots. Legislation has been passed in some states and is underway in others to require use of the equipment. It sells for less than $5.

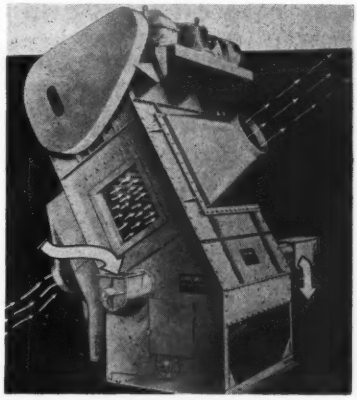
MULTI-LOUVRE DRYERS SUBJECT OF L-B BOOK

Multi-Louvre dryers and how they work are described in a new 16-page book just published by Link-Belt Co.

Containing information on drying, cooling and processing of bulk materials, the book illustrates how the dryer is used in the coal, food, chemical processing and fertilizer industries for accurate temperature control and fast treatment of bulk materials.

Typical layouts, dimensional data and a two-page psychrometric chart are included as are step-by-step descriptions of how the Link-Belt Multi-Louvre dryer works.

Basically, Link-Belt says, the Multi-Louvre dryer consists of a housing through which air is forced at controlled temperatures. A screw paddle and moving louvre pans raise the material to be



treated and permit it to flow gently downward—like a constantly moving fine curtain—

through which heated or cooled air, gas or steam can be drawn.

For a copy of the new book,

CIRCLE 117 ON SERVICE CARD

READY-SPAN CONVEYOR FROM JOY MANUFACTURING

Joy Manufacturing Co.'s Ready-Span Conveyor consists of standardized, pre-fabricated sections of various lengths, bolted together in any arrangement at the job site to make up total length required.

Each section is made up of four 1½" pipe cords connected by ¾" pipe diagonals to form a laced frame truss. All accessories —idlers, walk ways, cover decking, hoods, supports and special items—clamp to the pipe for location as desired.

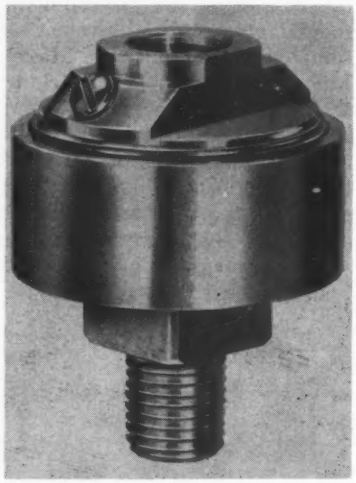
Trusses are available in all standard belt widths and in two depths: 24" c/c for spans up to 50 feet; 42" c/c for spans up to 100 feet.

For details on the Ready-Span

CIRCLE 118 ON SERVICE CARD

DIAPHRAGM ASSEMBLY FOR USE WITH N SOLS.

Jas. P. Marsh Corp. reports development of a new aluminum diaphragm assembly designed particularly for use with nitrogen solutions and other pressure mediums not injurious to aluminum.



The unit is designed for field assembly and may be used with any reliable fluid-filled pressure gauge. It is suitable for applications using up to 200 pounds pressure, says Marsh.

The entire housing is of aluminum, the diaphragm of Buna-N, a flexible, rubber-like material.

For more information

CIRCLE 119 ON SERVICE CARD

TRANSLAND STARTS AG-2 AIRPLANE PRODUCTION

To meet anticipated demand for the Ag-2 agricultural and forestry airplane, Transland Co.'s factory has already started production to complete 3 airplanes in May, and a total of 42 Ag-2's during 1957.

The firm said recently that with more than 100 flights entered in its log book, the plane is rapidly nearing its CAA Part III Certification.

CLASSIFIED ADVERTISING

NEW RATES . . .
Help wanted, positions wanted, used machinery and business opportunities are now charged at only 10 cents per word, $2.00 minimum. Count box number as five words.

Display ads . . . $15.00 per column inch, minimum of one inch. Ads over the minimum are accepted only in multiples of one half inch.

For prompt results, send your classified ads to Farm Chemicals, 317 N. Broad St., Philadelphia 7, Pa.

Closing date: 10th of preceding month

FOR SALE

FOR SALE: 3—Sprout Waldron size 12, style B horizontal ribbon mixers, 336 cu. ft. (10/12,000#) working capacity. Perry Equipment Corp., 1430 N. 6th St., Phila. 22, Pa.

FOR SALE: Aluminum Storage Tanks 2700 gal. to 23,000 gal. capacity. Perry Equipment Corp., 1430 N. 6th St., Phila. 22, Pa.

FOR SALE: Fertilizer manufacturing plant in Ottawa, Ohio, on 4/5 acre land. Business in continuous operation since 1938. Plant well located, fully equipped, electrically operated, and on railroad siding in thriving farm area. Write Fairfield Enterprises, 347 Madison Ave., New York 17, N. Y.

HELP WANTED

WANTED: Supervisor for fertilizer sales and plant operations in New York State. Send full details of experience, qualifications and salary expected. Address "595" care FARM CHEMICALS, 317 N. Broad St., Philadelphia 7.

Suppliers' Briefs

Bemis Bro. Bag Co. C. W. Loomis, vice president, company director and director of personnel, has retired and is succeeded by F. V. Deaderick. Replacing Deaderick who had been vice president, director of eastern operations and a company director is R. V. Scott.

Blaw-Knox Co. has named W. Earl Dunn as vice president and general manager of the Chemical Plants Div.

Chase Bag Co. Promotion of R. H. Ayers to the position of sales manager, Pager Bag Div., and of Roy H. Ploeger to manager, Toledo Sales Div. has been announced by W. N. Brock, vice president and general sales manager.

Clark Equipment Co. has named three new dealers to sell and service fork-lift trucks, straddle carriers and powered hand trucks produced by its Industrial Truck Div.: Morgans, Inc., Jacksonville, Fla.; Naumann Lift Trucks, Inc., Phoenix, Ariz. and Gray Lift, Inc., Fresno, Calif.

Continental Can Co. John C. Michaud has been elected vice president of the newly-formed Containerboard and Kraft Paper Div.

Dorr-Oliver Inc. George M. Darby has retired as director of the Westport Mill, D-O Laboratories at Westport, Conn. With Darby's retirement, Bryant Fitch, presently research director, will assume responsibilities for overall operation of the Westport Mill —both research and service functions.

Davidson-Kennedy Co. announces formation of Davidson-Kennedy Associates. The new firm will act as an engineer-contractor and will carry out design, procurement of equipment and materials and erection of chemical process plants and facilities. President is Thornton Kennedy, also president of Davidson-Kennedy Co. Offices will be in Chicago and Atlanta.

Link-Belt Co. sales of $163,921,863 for 1956 were the highest in the company's history, exceeding 1955 sales by 27 per cent. Net earnings were $11,072,134, an increase of 46 per cent over the $7,602,960 reported for 1955.

Yale & Towne Mfg. Co.'s Materials Handling Div. has established industrial lift truck sales and service sub-branches in Baltimore, Md. and Harrisburg, Pa., which will operate under the direction of the Philadelphia Branch.

by Dr. Melvin Nord

PATENT REVIEWS

PLANT GROWTH REGULANTS AND HERBICIDES

U. S. 2,768,889, issued Oct. 30, 1956 to Jeremiah F. Twomey and Frank H. Peto, discloses a method of counteracting detrimental effects on crop yields caused by plant hormones such as 2,4-D.

According to the inventors, the hormone immediately increases the growth rate of plants to such an extent that they are unable to absorb enough of the minor elements (boron, magnesium, zinc, copper, iron, cobalt and molybdenum) from the soil. The result is an upset in chemical balance.

The solution to the problem, according to the inventors, is to add these trace elements along with the hormone. The results of field tests cited in the patent indicate significant increases in crop yields.

U. S. 2,769,702, issued Nov. 6, 1956 to Frank J. Sowa, describes herbicidal compositions containing ammonium silicofluoride or triethylamine silicofluoride. An advantage is that the plants are not rendered inflammable.

U. S. 2,770,537, issued Nov. 13, 1956 to Allan E. Smith, Albert W. Feldman and Gracie M. Stone, assigned to United States Rubber Co., discloses improvements in N-1-naphthylphthalamic acid herbicidal compositions. The tendency of these herbicides to be leached out of soil is reduced by the use of inorganic compounds which contain ionizable hydrogen and which give a strong acid reaction in water, e.g. sulfuric, hydrochloric, nitric, or phosphoric acid, or an alkali bisulfate.

U. S. 2,771,477, issued Nov. 20, to Lindley S. De Atley, Edwin T. Upton, and John D. Howland, assigned to Thompson-Hayward Chemical Co., discloses a series of low volatile herbicides having as the active ingredients aryloxyalkanecarboxylic acid esters of alkanolamines.

CROP STORAGE

U. S. 2,768,896, issued Oct. 30, 1956 to Fred F. Lewis, provides a method for storing agricultural crops, within a water-impervious coating, e.g. polyethylene.

A polyethylene surface is first sprayed onto the ground. The grain or other agricultural product is placed on the sprayed surface. Then the top and sides of the pile are sprayed also. The material dries to form a protective layer which adheres to the agricultural product.

INSECTICIDES & FUNGICIDES

U. S. 2,768,965, issued Oct. 30, 1956 to Harry A. Stansbury and Howard R. Guest, assigned to Union Carbide & Carbon Corp., describes a method of synthesis of insecticides analogous to those found in pyrethrum flowers. Chrysanthemum monocarboxylic acid anhydride is reacted with a substituted 3-methyl -2-cyclopenten-4-01-1-one to form the insecticidally-active ester.

U. S. 2,769,743, issued Nov. 6, 1956 to Raymond W. Mattson and assigned to Union Oil Co. of California, describes compositions for use in pest control. The compositions are diaryl esters of benzene-phosphorous, or benzene-thiophosphonic acid.

U. S. 2,769,745, issued Nov. 6, 1956 to John L. Hardy and assigned to The Dow Chemical Co., discloses the use of divinyl benzene or ethyl vinyl benzene as a method of control of soil-inhabiting fungi and nematodes which attack the underground parts of plants.

U. S. 2,770,567, issued Nov. 13, 1956 to Karlfried Wedemeyer and Detlef Delfs, assigned to Farbenfabriken Bayer Aktiengesellschaft, discloses insecticidal compositions of esters of thionophosphoric acid stabilized by organic sulfates or sulfonates.

U. S. 2,771,389, issued Nov. 20, 1956 to Harry W. Dye and assigned to Food Machinery & Chemical Corp., discloses a composition for controlling the growth of fungi, consisting of dichloronaphthaquinone and bentonite sulfur.

SOIL CONDITIONING

U. S. 2,770,077, issued Nov. 13, 1956 to Keith L. Smith and assigned to Union Carbide & Carbon Corp., describes a method of improving the granule stability of surface soils, by the use of alkenyl succinic acids, anhydrides or salts.

U. S. 2,770,921, issued Nov. 20, 1956 to Lyle D. Goodhue and assigned to Phillips Petroleum Co., discloses an inexpensive soil conditioner and a method of producing it. The process involves the catalytic or non-catalytic reaction of ammonia and an organic aldehyde or ketone to form substituted pyridines. The fraction of this condensation product boiling above 185° C. is used. It is a heavy viscous oil which can be applied directly to the soil, or it may be added in a water emulsion.

FERTILIZERS

U. S. 2,769,686, issued Nov. 6, 1956 to Robert F. McCullough and Ira M. LeBaron, assigned to U. S. Atomic Energy Commission, relates to the treatment of the leached zone material overlying Florida pebble phosphate deposits, for the recovery of phosphorus and uranium values.

U. S. 2,769,703, by Louis E. Andres and Yves J. Berquin, and U. S. 2,769,704, by Louis E. Andres and Pierre G. Pagny,—issued Nov. 6, 1956 and assigned

to Potasse & Engrais Chimiques, —describe processes for producing from phosphate rock, fertilizers containing calcium phosphate in fully available form, yet which contain no water-soluble phosphates. The rock is treated with nitric acid and the mixture is neutralized with aluminum hydroxide or iron hydroxide.

U. S. 2,770,008, issued Nov. 13, 1956 to William W. Yeandle, Nolan A. Carter and James T. Purnell, assigned to Deere & Co., describes a process for the production of urea prills, without the use of drying apparatus, and without decomposition of the material. The moisture content of the urea is about 0.5 per cent and the temperature is maintained slightly above 262° F.

U. S. 2,770,451, issued Nov. 13, 1956 to Lawrence H. Almond and assigned to Tennessee Valley Authority, describes a furnace for defluorinating phosphate rock.

U. S. 2,770,538 and 2,770,540, issued Nov. 13, 1956 to Donald E. Vierling, describe processes for producing liquid fertilizers made from free ammonia, urea, phosphoric acid, potassium hydroxide, and nitric acid.

U. S. 2,770,539, issued Nov. 13, 1956 to Simon J. Martenet, describes a process for producing a mixed fertilizer in granular or nodular form.

U. S. 2,771,353, issued Nov. 20, 1956 to Emory W. Douglass and Parker S. Dunn, assigned to Potash Company of America, describes a method of producing a fused potash product which can be readily handled, is not friable, and which is highly resistant to caking when exposed to an atmosphere of high humidity.

NEW BOOKS & BOOKLETS FROM GOV'T.

Market Analysis Tools—Country Business Patterns. Available at 20 cents per copy from Government Printing Office, Washington 25, D. C. or from Dept. of Commerce Washington office or field offices.

Featured in this new 40-page publication is the importance of using a scientific marketing approach in today's highly competitive business climate, and some general procedures for establishing a planned, scientific marketing program based on market facts and geographic market potentials.

Practical methods are described for applying data from County Business Patterns, a Census Bureau compilation of material gathered by the Bureau of Old Age and Survivors Insurance.

Secretary of Commerce Sinclair Weeks said that the publication was designed and written particularly to aid the smaller firms with less knowledge or experience in application of basic marketing data. He emphasized that the same market analysis procedures now being used so successfully by larger firms can be just as effectively and profitably used by smaller companies.

Testing of Weighing Equipment, National Bureau of Standards Handbook H37, by Ralph W. Smith, reprint, 184 pages, $1.25. Order from Government Printing Office, Washington 25, D. C.

One of a series of handbooks designed to present in compact form comprehensive information on weights and measures supervisions, it also describes various types of scales and weights, principles of their operation, and methods for their inspection and test.

The Bureau of Standards reports that although the book was prepared primarily for use by weights and measures officials of the states, counties and cities, much of the information presented also has proven to be of interest and assistance in maintaining weighing equipment in commercial and industrial establishments.

CHEMICALS

VELSICOL EXPANDS MIDWEST HEPTACHLOR PROMOTION

A greatly expanded promotional campaign in the Midwest, pushing the use of Heptachlor for soil insect control, has been announced by L. E. Carls, advertising manager of Velsicol Chemical Corp. Increased farm paper advertising, more dealer promotional material, new literature, and direct mail will be used this year to promote use of Heptachlor and Heptachlor-fertilizer mixtures for control of corn rootworms, wireworms and other soil insects that damage corn, sorghum, small grain and legume crops. More than 12 million advertising messages and 50,000 direct mail messages will be used to tell the Heptachlor story, said Velsicol.

Program materials are now available to the trade. Additional information may be obtained if you

CIRCLE 120 ON SERVICE CARD

ROCKY MTN. STATES SHOW GOOD SULFUR POTENTIAL

Five Rocky Mountain states—Wyoming, Colorado, Utah, New Mexico and Arizona—are potentially important contributors to the Nation's sulfur supply, even though their present production is relatively small, according to a Bureau of Mines report.

The five states have no known sulfur deposits minable by the Frasch process, the report states. They do, however, contain large quantities of pyrites, sulfide ores of base metals and high-sulfur petroleum and natural gas, all of which are currently or potentially important sources of sulfur.

The report, written by F. L. Wideman, Bureau mining engineer at Salt Lake City, Utah, presents details of known sulfur sources in the area. A copy of the report, IC 7770, "A Reconnaissance of Sulfur Resources in Wyoming, Colorado, Utah, New Mexico and Arizona," can be obtained from the Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

"FERTILIZING FOREST LANDS" BOOKLET

Japanese forest scientists predict a reduction of 10 years in the time it takes to grow pulpwood, through the use of fertilizer in the forest, reports Dr. E. D. Crittenden, director of research, Nitrogen Div., Allied Chemical & Dye Corp.

Dr. Crittenden said this prediction and the research work supporting it is contained in a newly-translated, 35-page study of Japanese forest fertilization results which currently is being released.

Entitled "Fertilizing Forest Lands," the booklet was prepared by Dr. Takeo Shibamoto, Professor of Forestry at Tokyo University.

"One especially valuable contribution of this study is its emphasis on the economics of forest fertilization," Dr. Crittenden pointed out. "The Japanese researchers have calculated the monetary values of tree growth responses they have obtained; and they have shown that substantially larger profits are possible through increasing tree volume in a shorter length of time.

The full report, containing 17 tables and illustrations of tree response and cost data, will be sent to you free of charge if you

CIRCLE 121 ON SERVICE CARD

USDA RELEASES INSECT REPELLENT FOR COMM. USE

The best all-purpose insect repellent so far developed has been released by USDA for commercial use and probably will be available on the market this spring, the Department says.

The repellent is an organic chemical, diethyl toluamide. The compound was synthesized some years ago by USDA chemists at Beltsville. Its promise as an insect repellent was revealed in later tests at the Department's Orlando, Fla., entomology laboratory.

CHEMICALS COST LESS THAN THEY DID IN '52

Key chemical raw materials on the whole cost less now than they did in 1952, according to a special five-year price study recently published by *Oil, Paint and Drug Reporter*.

Among the agricultural chemicals, prices for anhydrous ammonia and other nitrogenous fertilizers shrunk 20 per cent, said OPD. Potash declined 16 per cent since 1952, while commercial insecticides were slashed up to 50 per cent, according to the study.

PEST REPORTS

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

INSECT ACTIVITY IS ON INCREASE

With the approach of spring, insect activity is on the increase over a wide area of the country. Although armyworm moths have been taken in light traps in some of the southern states throughout the winter, Louisiana by late February was reporting light populations of armyworm larvae in East Baton Rouge, St. John the Baptist, St. Helena and Tangipahoa parishes. Counts in small grain ranged from one to seven per 100 sweeps of the net with the size ranging up to the fifth instar.

The army cutworm was active in Oklahoma with averages of about three larvae per square yard for most small grain fields in Kingfisher county and up to 6 per square yard in Major county.

Heavy infestations of the glassy cutworm were causing localized damage in Merion bluegrass seed fields at Tehachapi, Kern county, California. The pests were not responding to treatment which in some cases had cost up to 75 dollars per acre.

Greenbugs which at various times during the past several years have caused extensive damage have been generally light during the past winter. A survey conducted in Texas during the month of February showed greenbugs to be in 10 Panhandle counties with no infestations found in nine. The heaviest populations were found in Castro, Deaf Smith and Parmer counties.

In Hansford county, the heaviest populations were in dryland wheat with populations of from 10 to 30 greenbugs per row foot. Greenbugs were present in damaging numbers in a few fields of Castro county mostly in irrigated wheat where populations reached 200 per row foot. No greenbugs were found in nine counties surveyed south of the Panhandle. In north central Texas, medium to heavy populations were reported from Van Zandt county and heavy localized damage occurred in Kaufman county during late February.

Light populations of greenbugs were reported on small grain in East Baton Rouge, East Carroll, St. Helena, Madison, Tangipahoa, Tensas and Concordia parishes, Louisiana. In late February, greenbugs were very scarce in Oklahoma and up to early March no specimens had been found in Kansas this year.

WINTER GRAIN MITE

The winter grain mite in early March was recorded as being medium to heavy on small grain in Van Zandt and Kaufman counties, Texas. Similar infestations were reported from the Dallas-Ft. Worth area and in a localized area of Robertson county. The brown wheat mite was fairly uniformly scattered over several Oklahoma counties but there were no reports of damage.

Pea aphids were reported on alfalfa from Georgia, Louisiana, Illinois and Arizona. Treatment was necessary for the spotted alfalfa aphid in some alfalfa fields in the Yuma valley of Arizona. This aphid was on the increase in Clark county, Nevada, and heavy populations were recorded in Brazos and Burleson counties, Texas. The remaining counties in Texas reporting the spotted alfalfa aphid recorded light infestations. The same was true for counties reporting in Oklahoma, Louisiana and Georgia.

Among the truck crop insects, the vegetable weevil was one of the most prominent in late February and early March. In Georgia, the pest was causing moderate to heavy damage to crucifers generally over the state. Reports of localized damage were received from North and South Carolina. Mississippi also reported the pest.

VEGETABLE PESTS

Other vegetable pests causing concern were the cabbage looper in Texas where controls were required in the lower Rio Grande Valley and the green peach aphid in California where infestations were heavy enough to require the plowing up of some spinach fields in Orange county. Aphids were also causing damage to untreated cabbage and brussels sprouts in the lower Rio Grande Valley of Texas.

A recent survey of the beet leafhopper situation in the western and southwestern part of the United States would indicate that the expected movement from the desert breeding grounds into the cultivated districts of north and south central Utah and western Colorado is expected to be light. The movement to southern Utah, southern Nevada and central Arizona is expected to be moderate. The local movement from the breeding grounds of northern and eastern Utah to the adjacent cultivated districts of northern Utah and western Colorado is expected to be light to moderate. These statements are based upon present conditions. Unpredictable weather fluctuations prior to migration can very easily change the outlook.

In late February, tobacco plant beds in parts of Georgia were infested with light to moderate populations of the green peach aphid, the vegetable weevil and

. . . PESTS

the tobacco flea beetle. The southern mole cricket was infesting plant beds in the Quincy, Florida, area and a springtail in Pitt county, North Carolina.

The first cotton insect condition report received from the lower Rio Grande valley of Texas indicated that with favorable weather conditions, insects should be less destructive this season than usual. The excellent clean-up practiced in the fall of 1956 was largely responsible. Some cutworm damage to cotton, however, has been reported in the San Benito and Los Fresnos areas. The fields concerned were planted to vegetables or were trashy during the winter. A build-up of fleahoppers was reported from one field northeast of Raymondville which had been planted early. Treatment of the field would be necessary if the population increased.

Results on the state-federal cooperative chinch bug hibernation survey have been released. As in the case with most insects, weather factors will play a decisive part in the initial 1957 infestation of this corn and small grain pest.

Indications are, however, that the number of bugs going into hibernation in northeastern Arkansas are sufficient to have a potential of a very severe infestation. This infestation extends into southeastern Missouri or the "bootheel area." Northeastern Oklahoma has a hibernating population rating from moderate to severe.

The west-central portion of Missouri shows a rating of very severe with the northern half of the state mostly moderate to severe with several counties carrying a very severe rating. The potential for Kansas is down from 1956 with ratings from light to severe all in the eastern part of the state.

All ratings for Iowa were in the southern fourth of the state and were predominantly light. A few counties showed a moderate rating with only two counties showing severe. The Illinois situation appears to be comparable with 1956 with the infestation tending to be in the central part of the state. Northern Indiana potential indicates a moderate infestation for 1957 with perhaps more acreage involved than in 1956. ▲

FARMER REPS. FAVOR WITCHWEED QUARANTINE

Farmer representatives from eight counties in North Carolina and South Carolina, where witchweed has been found, went on record as favoring a Federal quarantine against this recently discovered pest of corn and other crops at a public hearing called by USDA in Washington, D. C., March 5.

A committee of eight farmers, one from each of the affected counties—four in North Carolina and four in South Carolina—presented a statement at the hearing endorsing a Federal wicthweed quarantine in the interest of their own and other states. They urged, however, that regulatory action under the quarantine be confined to areas actually infested with the parasitic weed.

STATISTICS

SUPER OUTPUT, SHIPMENTS DOWN IN DECEMBER

December production of superphosphate and other phosphatic fertilizers in this country amounted to 207,777 short tons (100 per cent APA), compared with November output of 208,612 short tons.

Shipments totaled 136,427 tons, a decrease of 6 per cent from the volume shipped during the previous month. An increase of 3 per cent is reported in stocks on hand. December 31, 1956 stocks were 10 per cent higher than the quantities held by phosphatic material producers on December 31, 1955.

PHOSPHATE ROCK PRODUCTION UP IN '56

United States output of phosphate-rock ore and total marketable production of phosphate rock from July 1, 1955 through June 30, 1956, increased 15 per cent and 11 per cent, respectively, above the estimated figures for the year ending June 30, 1955, according to reports by producers to the Bureau of Mines.

Mine production totaled 46,736,794 tons (5,497,741 tons P_2O_5 content). Marketable production was 14,409,401 tons, (4,579,811 tons P_2O_5 content), valued at $89,099,633.

SULFUR OUTPUT SETS NEW RECORD

	Production	Mine or Plant Shipments	Apparent Sales	Producers' Stocks
Recovered Sulfur				
1955	401,650	404,223	400,125	120,267*
1956	480,980	468,226	481,801	119,446
Native Sulfur (Frasch)				
1955	5,743,344	5,838,851	5,790,166	3,181,198
1956	6,427,229	5,699,598	5,671,977	3,936,450

* Revised

SUPERPHOSPHATE IN 1956

	1956 in short tons 100% APA		1956 percentage change from 1955	
Grade	Production	Shipments	Production	Shipments
Normal	1,493,013	819,054	−4	−2
Enriched	12,888	5,118	−67	−64
Concentrated	751,831	718,622	+6	+14
Wet-base goods	6,729	6,055	−14	−10

Production — December, 1956

Compiled from Government Sources

Chemical	Unit	December 1956	December 1955	November 1956
Ammonia, synth. (anhydrous)	s. tons	290,512	272,748	*264,436
Ammonia liquor, coal & coke (NH_3 content)	pounds	———	3,893,664	———
Ammonium nitrate. fert. grade (100% NH_4NO_3)	s. tons	170,628	167,675	142,415
Ammonium sulfate				
synthetic (technical)	s. tons	71,700	104,457	82,001
coke oven by-product	pounds	———	167,386,683	———
BHC (Hexachlorocyclohexane)	pounds	6,759,526	4,892,565	4,421,205
Gamma content	pounds	1,220,124	902,239	979,724
Calcium arsenate	s. tons	[2]	[2]	[2]
Copper sulfate (gross)	s. tons	———	———	———
DDT	pounds	11,200,942	10,991,192	10,640,771
2,4-D Acid	pounds	3,089,429	2,402,896	2,521,570
esters and salts	pounds	[1]1,246,540	1,446,619	[1]1,884,882
esters and salts (acid equiv.)	pounds	[3]875,628	1,179,766	[3]1,381,952
Lead arsenate (acid and basic)	s. tons	333	813	[2]
Phosphoric acid (50% H_3PO_4)	s. tons	[1]275,711	304,081	279,192
Sulfur, native (Frasch)	l. tons	534,088	574,144	514,772
Recovered	l. tons	43,750	35,750	39,580
Sulfuric acid, gross (100% H_2SO_4)	s. tons	1,325,138	1,469,368	1,314,675
Superphosphate (100% APA)	s. tons	207,777	230,776	*208,612
Normal (100% APA)	s. tons	128,466	154,658	132,398
Enriched (100% APA)	s. tons	[2]	2,571	[2]
Concentrated (100% APA)	s. tons	61,115	72,707	*59,855
Wet Base (100% APA)	s. tons	[2]	840	[2]
Other phos. fertilizers	s. tons	16,747	15,191	14,644
2,4,5-T Acid	pounds	522,729	———	[3]514,085
Urea	pounds	86,571,820	———	81,101,801

* Revised. [1] Includes quantities for 1 plant previously not reporting. [2] Withheld to avoid disclosing figures for individual establishments. [3] Partly estimated.

FERTILIZER MATERIALS MARKET

New York

March 20, 1957

Sulfate of Ammonia. While stocks were still ample, the steel miils in most cases have decreased their production and exports have taken a large quantity for shipment to the Far East. Domestic fertilizer demand has recently increased, so the producers are now in a better position.

Ammonium Nitrate. One large producer has announced a new pellet grade will soon be available to the trade. In the meantime shipments to the fertilizer trade have increased and a better demand is looked for over the next 60 days.

Urea. One large producer is raising the price $5 per ton, effective April 1, because of the better demand mostly for industrial purposes. Fertilizer demand is still spotty.

Nitrogenous Tankage. Some producers reported a little better demand for quick shipment and some of the stocks in storage were being cut down. The price range was still the same; $3 to $4 per unit of ammonia ($3.64 to $4.86 per unit N), according to shipping points.

Castor Pomace. One large producer has decided to close his plant for the time being and this material continues scarce for nearby shipment with last sales made on the basis of $45.50 per ton, f.o.b. production points. Some imported material was reported scheduled to arrive at a Southern port.

Organics. There was a slight increase in buying interest for organic fertilizer materials for nearby shipment. Last sales of dried blood were made at $5.25 per unit of ammonia ($6.38 per unit N), f.o.b. Eastern productions points and tankage sold at $5 per unit ($6.08 per unit N), f.o.b. New York. Soybean meal was available at $45.50 per ton in bulk, f.o.b. Decatur, Ill., and linseed meal firmed up about $1 per ton. Cottenseed meal was slightly easier in price because of smaller demand from the feed trade.

Fish Meal. Little trading was reported in this material and most fish factories were able to fill orders from exisiting stocks at about $142 per ton, f.o.b. production points. Very little imported fish meal was arriving because of ample stocks on hand of domestic material.

Bone Meal. Some movement was reported both from the fertilizer and feed trade with fertilizer bone meal selling at $60 per ton and better grade of feeding bone meal selling at $65 per ton, f.o.b. shipping points. Some imported feeding bone meal continued to arrive from time to time.

Hoof Meal. This material was a routine affair with last sales made on the basis of $5.75 per unit of ammonia ($6.99 per unit N), f.o.b. Chicago.

Superphosphate. Both normal and triple superphosphate were in good supply and buyers were able to order material as needed. Production is not adequate to supply any anticipated needs of the buyers.

Potash. Shipments were reported moving at a good rate but there was a tendency upon the part of buyers to only take material in as needed. No price changes were noted.

Philadelphia

March 20, 1957

Movement of raw materials has picked up some, but is still behind last year at this time. Stocks on hand continue large, though rather heavy export shipments have afforded some relief. While urea has advanced, other prices remain more or less on the level as last report. Blood and tankage are very slightly easier. Castor pomace is still unobtainable.

Sulfate of Ammonia. The demand has improved somewhat, but is not so good as a year ago. Stocks are very large.

Ammonium Nitrate. Prospects are reported a little brighter and movement to the fertilizer trade has started. Production, however, is still far ahead of demand, and inventories are sizable.

Nitrate of Soda. Prices remain unchanged, supply is ample, and the movement somewhat better.

Urea. The price has been advanced five dollars per ton, to $110 per ton for agricultural grade. Imports are increasing.

Blood, Tankage, Bone. Blood is currently quoted at $6 per unit of ammonia ($7.29 per unit N), Chicago area, and $5.25 per unit ($6.38 per unit N), New York area. Tankage at $6 per unit ($7.29 per unit N), Chicago and $5 ($6.08 per unit N), New York. Fertilizer bone meal remains more or less nominal at $60 per ton, while the feeding grade is listed at $72 to $75 per ton. Demand is light.

Fish Scrap. This is still listed at $137 per ton for scrap, and $140 per ton for meal, with supply limited and demand quiet.

Superphosphate. This is still listed at 88 cents to 91 cents per unit a.p.a. per ton for the normal grade. Supplies very plentiful.

Potash. Price remains at 38 cents per unit K_2O per ton for muriate, with ample stocks available. Movement is somewhat improved. ▲

BILL INTRODUCED TO EXEMPT TRUCK FERTILIZER SHIPMENTS FROM ICC REGULATION

Washington, D. C. — Rep. E. C. Gathings (D-Ark.), has (Mar. 7) introduced a Bill (H. R. 5765) to provide an exemption from economic regulation by the Interstate Commerce Commission in the case of fertilizer and fertilizer materials when being transported by truck.

The Bill was referred to the House Committee on Interstate and Foreign Commerce, but hearings have not been scheduled.

The Bill would amend Clause (6), Section 203 (b) of the Interstate Commerce Act, which now provides exemptions for livestock, fish and unmanufactured agricultural commodities. The Gathings Bill would add "fertilizer and fertilizer materials."

Mr. Paul T. Truitt, Executive Vice President of the National Plant Food Institute, explained that if enacted, H. R. 5765 would permit anyone to transport fertilizer for hire by motor truck without getting a certificate of public convenience and necessity from the Interstate Commerce Commission or without filing a tariff naming the rate to be charged. He added that "the present law exempting agricultural commodities from such economic regulation has been regarded as beneficial by the agricultural community."

Fertilizer materials are defined in the bill as follows: Phosphate rock, superphosphate, potash salts, nitrogen compounds, and any other plant food which shall be used singly or as a part of any mixture of plant foods, either solids, liquids, or gases.

"The successful passage of the Bill would be helpful to farmers," Truitt said. "If approved, the delivery of fertilizers would be facilitated during the spring season when demand is at a peak."

It should be noted that as we go to press no hearings on the Gathings Bill have been scheduled. Congress is somewhat apathetic to backing the bill and without the demand for hearings the bill may be destined for a silent death:

An appeal to your Congressman may prevent just such a thing happening. After all this bill was introduced to give the farm chemicals industry a favorable break on the transportation of fertilizer materials. Besides this enactment could mean a reduction of costs to the farmer at a time when he needs it most.

Alphabetical List of Advertisers

African Pyrethrum, New York City — —
American Agricultural Chemical Co., New York City 30
American Cyanamid Co., New York City 15
American Potash & Chemical Corp., Los Angeles, Calif. 5
Armour Fertilizer Works, Atlanta, Ga. —
Ashcraft-Wilkinson Co., Atlanta, Ga. 27, 67
H. J. Baker & Bro., New York City —
Baughman Mfg. Co., Jerseyville, Ill. 20, 21
Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans. —
Bradley & Baker, New York City —
Bradley Pulverizer Co., Allentown, Pa. —
Burlap Council, New York City 29
Chase Bag Co., Chicago, Ill. Second Cover
Clark Equipt. Co., Benton Harbor, Mich. —
Clover Chemical Co., Pittsburgh, Pa. —
E. D. Coddington Mfg. Co., Milwaukee, Wis. —
Cole, R. D. Mfg. Co., Newnan, Ga. 58
Commercial Solvents Corporation, New York City —
Davison Chemical Co., division of W. R. Grace & Co., Baltimore, Md. —
Duval Sulphur & Potash Co., Houston, Tex. 27
Edwards Laboratory, Norwalk, Ohio —
Escambia Chemical Corp., Pensacola, Fla. —
Exact Weight Scale Co., Columbus, Ohio 68
Finco, Inc., North Aurora, Ill. —
Geigy Agricultural Chemicals, New York City 1
Grand River Chem. Div., Deere & Co., Tulsa, Okla. —
Highway Equipment Co., Cedar Rapids, Ia. —
Hough, The Frank G. Co., Libertyville, Ill. Back Cover
Hudson Pulp & Paper Corp., New York City 25
Indian Jute Mills Association, New York City 29
International Mineral & Chemicals Corp., Chicago, Ill.
Spec. Prod., Phosphate Chemicals Div. 6, 7
Phosphate Minerals Div. —
Potash Div. —
Jackle, Frank R., New York City 62
Joy Manufacturing Co., Pittsburgh, Pa. —
Keim, Samuel D., Philadelphia, Pa. 67
Kraft Bag Corporation, New York City —
Eli Lilly & Co., Indianapolis, Ind. 12, 13
Link-Belt Co., Chicago, Ill. —
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo. 22
Merck & Co., Inc., Rahway, N. J. 41
Mississippi River Chem. Corp., St. Louis, Mo. —
Monarch Mfg. Works, Inc., Philadelphia, Pa. 59
Monsanto Chemical Co., St. Louis, Mo. 23
Munson Mill Machinery Co., Utica, N. Y. —
National Lime & Stone Co., Findlay, Ohio 61
National Potash Co., New York City 9
Nitro-Form Agricultural Chemicals, Woonsocket, R. I. —
Nitrogen Division, Allied Chemical & Dye Corp., New York City 33–36
Pennsylvania Salt Mfg. Co. of Wash., Tacoma, Wash. —
Phillips Chemical Co., Bartlesville, Okla. —
Pioneer Pyrophyllite Producer, Torrance, Calif. —
Potash Co. of America, Washington, D. C. Third Cover
Poulsen Co., Los Angeles, Calif. —
Rapids Machinery Co., Marion, Iowa 64
Schmutz Mfg. Co., Louisville, Ky. 40
Shuey & Company, Inc., Savannah, Ga. 59
Sinclair Chemicals, Inc., Chicago, Ill. —
Sohio Chemical Co., Lima, Ohio —
Southwest Potash Co., New York City 11
Spraying Systems Co., Bellwood, Ill. 67
Stedman Foundry and Machine Co., Inc., Aurora, Ind. 28
Stephens-Adamson Mfg. Co., Aurora, Ill. —
Sturtevant Mill Co., Boston, Mass. —
Tennessee Corporation, Atlanta, Ga. 3
Texas Gulf Sulphur Co., New York City —
Thomas Alabama Kaolin Co., Baltimore, Md. 10
Tractomotive Corp., Deerfield, Ill. —
Union Bag-Camp Paper Corp., New York City 26
U. S. Graphite Co., Saginaw, Mich. 17
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla. 39
United States Potash Co., New York City 19
Velsicol Chemical Corp., Chicago, Ill. —
Wisc. Alumni Research Foundation, Madison, Wisc. —
Woodward & Dickerson, Inc., Philadelphia, Pa. 69

That Personal Touch

"The degree of increase in the use of pesticides and fertilizers is going to be largely dependent on the education of people regarding the increased benefits to be derived and the personal way in which you present this story."

Assuming that this statement is true, and there is no reason why it shouldn't be, I wonder if this isn't the year when the sales techniques of a friend of mine are really going to pay off!

It isn't guaranteed to work everytime, but it has a pretty high average over a period of years. Here's how it works: He takes the time to investigate and analyze each sales prospect . . . and if he feels that the need is there after this treatment why he moves right in. It takes him a little longer to get started this way but once he starts talking he doesn't stumble on the usual roadblocks, because he has a good logical answer for each request or he wouldn't be there in the first place. He is in a position where he isn't just saying he's interested in you—he can prove it by the personal knowledge he has about your operation. And when you get this personal attention you can't help feeling that maybe his interest is more in helping you than in making a sale. It almost borders on the kind of interest a partner would exhibit. And he gets to feeling that way too, without ever losing sight of the fact that the end result of this feeling is going to be a sale. You'd be surprised at the number of places that consider him a consultant instead of a salesman.

Yes, you might say that he was selling and not educating and you would be right. But it was his *personal interest* in educating you to the benefits to be derived from using his product that set the stage for the final sales pitch. And therein lies the difference.

Another nice thing about this type of sale is that you won't be afraid to go back because "partners" are always welcome.

Maybe this type of selling was in effect what Mr. F. W. Hatch, Manager of the Agricultural Chemicals division of Shell Chemicals had in mind last month when in his presidential address to the NAC spring meeting delegates he said that one of the factors that is affecting the industry today is the need for improvement in our selling effort.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.

AMMONIA—Anhydrous and Liquor
American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Chem. Corp., Pensacola, Fla.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Chicago, Ill.
Sohio Chemical Co., Lima, O.

AMMONIUM NITRATE
American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Chem. Corp., Pensacola, Fla.
Monsanto Chem. Co., St. Louis, Mo.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

BAGS—BURLAP
The Burlap Council, New York City
Chase Bag Co., Chicago, Ill.

BAGS—COTTON
Chase Bag Co., Chicago, Ill.

BAGS—Multiwall-Paper
Chase Bag Co., Chicago, Ill.
Hudson Pulp & Paper Corp., N.Y.C.
Kraft Bag Corporation, New York City
Union Bag—Camp Paper Corp., New York City

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
E. D. Coddington Mfg. Co., Milwaukee, Wisc.
Kraft Bag Corporation, New York City
Stedman Foundry and Machine Co., Aurora, Ind.
Union Bag—Camp Paper Corp., New York City

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.

BIN LEVEL CONTROLS
Stephens-Adamson Mfg. Co., Aurora, Ill.
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.

BIN DISCHARGERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS
Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM AMMONIUM NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.

CALCIUM NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

CAR PULLERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.

CHEMISTS AND ASSAYERS
Shuey & Co., Inc., Savannah, Ga.

CHLOROBENZILATE
Geigy Agr. Chems. Div. Geigy Chem. Corp. N.Y.C.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Velsicol Chemical Corp., Chicago, Ill.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
National Lime & Stone Co., Finlay, Ohio
U. S. Graphite Co., Saginaw, Mich.

CONVEYORS
Baughman Mfg. Co., Jerseyville, Ill.
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Finco Inc., North Aurora, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE
Tennessee Corp., Atlanta, Ga

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
Geigy Agr. Chems., Geigy Chem. Corp., N.Y.C.
Monsanto Chem. Co., St. Louis, Mo.

DIAZINON
Geigy Agr. Chems. Geigy Chem. Corp., N.Y.C.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

DITHIOCARBAMATES
Berkshire Chemicals, New York City

ELEVATORS
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN
Velsicol Chemical Corp., Chicago, Ill.

ENGINEERS—Chemical and Industrial
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid
Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—MIXED
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS
Bradley & Baker, N. Y. C.

Fish SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Tennessee Corp., Atlanta, Ga.

GIBBERELLIC ACID
El. Lilly & Co., Indianapolis, Ind.
Merck & Co., Rahway, N. J.

HEPTACHLOR
Velsicol Chemical Corp., Chicago, Ill.

HERBICIDES
American Cyanamid Co., New York City
American Potash & Chemical Corp., Los Angeles, California
Monsanto Chem. Co., St. Louis, Mo.

HOPPERS & SPOUTS
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

KAOLIN
Thomas Alabama Kaolin Co., Baltimore, Md.

INSECTICIDES
American Agricultural Chemical Co., N. Y. C.
American Cyanamid Co., New York City
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Velsicol Chemical Corp., Chicago, Ill.

IRON CHELATES
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Tennessee Corp., Atlanta, Ga.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LABORATORY SERVICES
Wisc. Alumni Research Foundation, Madison, Wisc.

LEAD ARSENATE
American Agricultural Chemical Co., N.Y.C.

LIMESTONE
American Agricultural Chemical Co., N.Y.C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Finlay, Ohio

MACHINERY—Acid Making and Handling
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Bradley Pulverizer Co., Allentown, Pa.
Finco Inc., North Aurora, Ill.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Clark Equipt. Co., Construction Mach. Div., Benton Harbor, Mich.
Finco Inc., North Aurora, Ill.
Hough, The Frank G. Co., Libertyville, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora Ind.
Stephen-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

MACHINERY—Mixing and Blending
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Munson Mill Mach. Co., Utica, N. Y.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY Superphosphate Manufacturing
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MALATHION
American Cyanamid Co., New York City

MANGANESE SULFATE
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, Washington, D. C.

METHOXYCHLOR
Geigy Agr. Chems., Div. Geigy Chem. Corp. N.Y.C.

MINOR ELEMENTS
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Munson Mill Mach. Co., Utica, N. Y.
Rapids Machinery Co., Marion, Iowa
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF SODA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Chem. Corp., Pensacola, Fla.
Lion Oil Company, El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Chicago, Ill.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION
American Cyanamid Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Monsanto Chem. Co., St. Louis, Mo.

PHOSPHATE ROCK
American Cyanamid Co., New York City
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston Mass.

POTASH—Muriate
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
Southwest Potash Corp., New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS
Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers
Exact Weight Scale Co., Columbus, O.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS
Blue Valley Equipt. Mfg. & Eng. Co., Topeka, Kans.
Finco Inc., North Aurora, Ill.
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SHOVEL LOADERS
Clark Equipt. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Tractomotive Corp., Deerfield, Ill.

SOILTEST EQUIPMENT
The Edwards Laboratory, Norwalk, O.

SPRAYERS
Finco, Inc., N. Aurora, Ill.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK
Baughman Manufacturing Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE TANKS
Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA
American Cyanamid Co., New York City
American Agricultural Chemcal Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Phillips Chemical Co., Bartlesville, Okla.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N
Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER
Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS
Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div. Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM
Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES
Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

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68

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